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New Orleans Medical
and
Surgical Journal

Vol. 93 JUNE, 1941 No. 12

INAUGURAL ADDRESS*

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To you, my fellow members who are here representing the Louisiana State Medical Society, the expression of my policy requires few words: I pledge myself for the coming year to carry on the high ideals and purposes of this organization to the best of my ability, with your needed cooperation and God's blessings. To the guests may I explain that custom dictates that the incoming president on this occasion make a speech; tradition is the strongest of laws, so be patient.

It is fitting just now, as America is anxious and fearful for its liberty won by the sacrifices, travail and life's blood of our forefathers—a liberty endangered by the ambitions of a mad European paper-hanger, who with intrigue, mendacity and treachery, masked by eloquence, plunges three continents into war and leaves the rest of the world in anxiety and fear—it is fitting, I say, to dedicate these moments to the physician, the man of peace, who in time of stress devotes his knowledge and skill to the purposes of war, to salvage what the rest of mankind tries to destroy. It is appropriate just now publicly to acknowledge the debt America owes to the military surgeon; the professional who makes it a study and a life's work, forming a nucleus in time of peace, and around whom gather from their offices and wards the civilian doctors in time of war, to form the real force of the medical service; and to the contract surgeons, who in the past have rendered a noble service, little appreciated, and have done so without hopes of advancement or recognition. Of these men I would speak to you. We call them army surgeons, though appropriately in the past and in line with their work they are army physicians as well.

The surgeon, as we picture him, know him and appraise him, is a comparatively recent arrival on the scene. The great characters of ancient medicine were essentially internists, Hippocrates and Galen as examples. The surgeon as we first find him was not held in high repute, and was looked upon with a wee bit of suspicion. He comes on the world's stage an itinerant specialist, peddling his wares through the countryside, his technic a kind of faulty sleight of hand, and his ethics in the early embryonic state. For centuries he led a hybrid existence, half-barber and half-surgeon, but the halves were not equal for he was first a barber apprentice; hence the red stripe which adorns the pole by the door of the present tonsorial parlors, a deserved heraldic bend. Up to the time of Frederick the Great, the duties of the army surgeon included the shaving of the officers of the line. The Barber-Surgeon Guild was dissolved in England less than two hundred years ago. The surgeon first received recognition and respectability, as an army surgeon, and there the first great surgeon appeared; he, who discarded magic and superstition and dogma, to utilize his powers of observation and make his own deductions, Ambroise Paré. Garrison, the medical historian, places him along with John Hunter and Lord Lister, as the world's three great surgeons of all time, the prototype of the

*Read before the sixty-second annual meeting of the Louisiana State Medical Society, April 22, 1941.

American army surgeon, a sketchy picture of whom I shall try to give you.

The defiance of the Colonies against King George III and his Empire was undertaken with great spirit, but about all the Revolutionists possessed was a cause, and very little training or equipment for war. There were about thirty-five hundred doctors scattered throughout those thirteen colonies; two hundred of them held diplomas, there being two medical schools, one in Philadelphia and the other in New York. Twelve hundred of these men served in the army or navy. One of Washington's first acts, after an inspection of the army, was to recommend to the Continental Congress the organization and improvement of the army medical service, but as this remarkable man with his ragged army at Valley Forge reflected the true status of the poverty and depletion of the army, one needs little imagination to realize the lack of equipment in the little considered medical service in the Revolutionary War. The army surgeon frequently fought in the line, and the battle over, repaired to the nearest available farm house utilized as a hospital, to function as a surgeon, limiting his efforts mostly to amputations, probing for bullets, trepanning and the treatment of fractures. His position did not merit a uniform; he was provided with one, during the War of 1812, black in color, we hope without logic, and of all things patterned after the paymaster's, but with the collar higher in the front and more uncomfortable. His pay was one and one-third dollars per day and this in Continental money. As has always been the case, his duties were more those of the physician than the surgeon. Thomas Jefferson, in a letter to one of his friends, states that "more than half of the army is down with the smallpox." Jenner was then making his classical observations which were to make him famous and help rid the world of smallpox.

As in all wars, diarrhea and dysentery plagued them. A medical officer, writing to his general, states that there might be a dietary factor in dysentery but that in his opinion cold and exposure are the important etiologic considerations, and suggests that each man be provided with a woolen undershirt, to be worn according to Benjamin Franklin's advice, until mid-summer and then be put back on the next day. As might be expected in an army so poorly supplied, scurvy was rampant. We read that the approach of spring is hailed with its wild onion, which was found to be a specific treatment even if slightly heroic. The treatment of the disease was an initial dose of calomel grains 30, with grains 11 every hour thereafter, accompanied by bleeding every thirty to thirty-six hours.

John Jones' "Treatment of Wounds & Fractures" written in 1775, was the first medical book by an American author. Pus in a wound was the natural and expected thing and the term infection reserved for the complications of erysipelas, gangrene and secondary hemorrhage. "Flying" ambulances were used, chariot-like in construction, designed and used rather to carry the doctor to the patient in the field than the patient to the doctor. It is interesting to note that the word "ambulance" is derived from the Latin *ambulare*, meaning to walk, and originally was applied to a mobile hospital which followed the army. Typhoid, typhus and pneumonia were prevalent. But, if in our present state of knowledge we look back with little regard for the medical and surgical attainments of our profession in those stormy days, we must attribute all to the state of knowledge of the day and remember that they also excelled in other lines, many being governors, judges, legislators, cabinet members, diplomats and generals. The signature on the Declaration of Independence, following that famous one of John Hancock's, is a physician's. Five of the fifty-six signers were physicians.

The medical history of the War of 1812 may be summarized with the statement that, of more than eleven thousand hospital admissions, there were but seven operations performed. One of the men who served here, William Beaumont, was to make his classical observations a few years later on the equally famous St. Martin and establish a scientific basis for gastric function. Re-

member, Laennec was yet to fold his paper cone stethoscope and publish his classic on signs of the chest.

The meteorologic reports of the post surgeons, begun in 1826 and compiled by the surgeon-general, established our present Weather Bureau. Ten years later the Surgeon-General's Library, now the Army Medical Library, was started, and is continued to today. It is said to be America's greatest contribution to the field of medicine. In the 1840's came anesthetics, ether, nitrous oxide and chloroform, to relieve a suffering world, and be used in the army for the first time with General Scott in Mexico, during which campaign Porter recorded that he did not see a single case of tetanus, hospital gangrene or secondary hemorrhage.

The War Between the States found both sides ill prepared. The Northern armies were supported by an industrial people, able to equip and maintain a medical service. The Southern army was backed by an agricultural people, soon cut off by the Federal blockade, and was never able to expand and properly equip its medical department, manned in the whole by physicians from the rural areas unaccustomed even to civil surgery. During this war, horse-drawn ambulances of two types were developed; hospital trains and boats were constructed, the former transporting a quarter of a million men. The City of Washington at one time had more than twenty thousand hospital beds. The Letterman Plan, for the evacuation of the wounded, was started in 1862, and has remained in substance the plan utilized up to and including the World War. Female nurses were authorized when expediency demanded, with remuneration at fifty cents per day. It must be recalled that just six years before, during the first year of the Crimean War, the English losses were two and one-half that of their allies, the French, when Florence Nightingale with her human genius for cleanliness appeared and the losses dropped to one-thirteenth of those of the French. In contrast to the Revolutionary War, calomel was stricken from the table of supplies. The death rate from disease alone was sixty-six per thousand. The horror of this period was hospital gangrene, differing from gas gangrene of today in that the flesh sloughed, crepitation was not noted, and secondary hemorrhage common, controlled by digital pressure by relays of men for periods up to three weeks.

The Southern surgeon with few exceptions utilized any available buildings for hospitals, the nursing by men from the ranks assigned for such duty, assisted by women volunteers. A picture of this phase of war is recorded by Kate Cummins of Mobile in her book, "The Confederate Army of Tennessee," a classic of its kind. The hospital records show that the wounds were treated with tannic acid solutions and chlorinated water, the hospital gangrene with nitric acid. The open wounds were given a slow continuous irrigation with cold water from elevated vessels, suggestive of the Carrel-Dakin treatment of the World War. It must be remembered that bacteriology was an unknown science and that Lord Lister was to publish his historical paper on antiseptic surgery, just four months after Lee surrendered at Appomattox Court House, a medical step which, with anesthesia, was to open the field of surgery to undreamed of limits.

In 1873 the first schools of nursing were opened in New York, Boston and Philadelphia. The 1890's were to bring the Widal test and the roentgen ray. With the explosion of the battleship Maine in Havana Harbor, Congress appropriated fifty million dollars to carry on the war with Spain and twenty thousand dollars was assigned the medical department as their part. Its supplies and personnel were meagre and the former finally were furnished more by the Red Cross than the national government. War wounds were no problem in this conflict, but typhoid demanded its toll.

At this time it was not known that malaria and yellow fever were transmitted by mosquitoes, practically unknown that typhoid could be conveyed in other ways than by water—the little knowledge that is so dangerous a thing. In eight camps there were thirteen thousand cases with nine hundred deaths, constituting 86 per cent of all

the deaths. Ignorance, not of the medical men in the service but of medical science as a whole, was the cause. No one man can be blamed; it was the characteristics of the day. Can we blame the quartermaster of that day for slow transportation; the signal officer for delayed communications which could not carry further than a ship could be seen? The Dodge Commission appointed by the President to inquire closely into all activities of the war concluded: "The well trained, faithful overworked surgeons deserve the thanks of the American people for their splendid work." To support these conclusions I need but to remind you that one of these men, Dr. Walter Reed, with three contract surgeons, was to form the committee for research into tropical diseases and establish beyond doubt that mosquitoes were the intermediary hosts in yellow fever, a revolutionary dictum which was to clear the tropics of this dreaded disease, remove fear from our Southern cities and make the completion of the Panama Canal a possibility and a reality; of Sternberg, the surgeon-general, the discoverer of the causative organism of pneumonia; of Dr. Darnell, another of them, who devised the method of making drinking water safe by chlorination, a method adopted all over the world, an achievement little appreciated, but one which has probably saved more lives than any other single human act.

The year 1901 saw the caduceus adopted as the insignia of the medical department; Fords began to rumble down the country lanes; the Wright Brothers took off at Kitty Hawk, little dreaming of the forces they had liberated to change human ways, to accelerate joy and multiply the sorrows of mankind. The year 1906 saw the first motor ambulance. Three years later typhoid vaccination was started in the army and too soon the Huns were on the march. While we watchfully waited, private interest, the medical societies and the army prepared. Forty-six ambulance companies were organized; fifty base hospitals were made ready by medical schools and established hospitals, these to be later the backbone of the service in France. Six of them arrived in France before Pershing and contributed the first officer, and the first enlisted man of the American army killed in action in the war. The medical department was to have new experiences. There was the demonstration of the efficacy of typhoid vaccine and sanitation (there were fifteen hundred cases of typhoid. Had the same rate prevailed as in the Spanish-American war, there would have been 500,000 cases); the administration of tetanus antitoxin, which kept this disease at a minimum; experience gained in treating the casualties of gas warfare—efficient in removing men from combat, but humane in that its toll of death was small; the treatment of too many cases of gas gangrene resulting from jagged wounds inflicted on the long fertilized fields of agricultural France, with the results none too spectacular; the firm establishment of the technic of debridement in devitalizing war wounds; the enthusiasms of the Carrel-Dakin method of treating wounds, an enthusiasm which waned with the years; the problem of shell-shock to those too frail in body and stability to withstand the horrors of modern warfare. Again there were ten times as many men admitted to hospitals with disease as there were with the wounds in battle. Influenza and respiratory diseases accounted for 82 per cent of all deaths. The magnitude of the service can be somewhat appreciated when it is stated that 7,000,000 men were examined, 4,000,000 men treated and that the personnel of the medical department on Armistice Day outnumbered by more than 100,000 the standing army in 1939. And this day heralded a peace which was not to endure. Today we feverishly prepare for any eventuality. How shall the medical profession meet the challenge? I think with befitting courage inspired by altruistic motives worthy of its past, as it tries to envisage the future's demands, profiting by Europe's experience.

With the modern trend of war and its objects to destroy whole cities, to maim and kill civilians, men, women and children, the necessarily resulting mass psychoneuroses bring to the medical man new problems; the concentration of armies tends to promote the spread of respiratory diseases and

thus increase the incidence of pneumonia. Science in the last few years has begun to make encouraging progress and within the last two years has lowered its mortality in a spectacular manner. That complex entity known as shock, resulting from trauma, its ways still perplexing, is receiving concentrated attention, but its major control apparently in sight. With blood banks for transfusion a reality in major hospitals, plasma banks appear to be a greater blessing in that they are more stable, more concentrated and more elastic in their use because they may have a wider application in both shock and hemorrhage. There are increasing accumulation of data that great bodies of men may in advance be protected against tetanus by prophylactic administration of the toxoid. There is encouraging hope that the sulfanilamide group which has accomplished so much in the treatment of pneumonia may prove a great blessing in the treatment of compound fractures, open wounds and peritonitis. Even dysentery, which has been an unwelcome camp follower in all wars, may have met its match in this marvelous group of drugs.

At one time the Red Cross carried some immunity from gun fire; today its adornment of a hospital roof merely invites disaster, a change which might force the abandonment of the present method of fracture treatment with its efficient traction apparatus aiming at perfection in results, as such complicated contraptions make it difficult or almost impossible to move the patient to a place of safety, forcing the treatment of many wounds with plaster casts in order that the patient may be transported quickly to a bombproof cellar. The medical personnel of aviation has its own problems brought on by high altitudes and speeds almost unbelievable in the modern fighting plane. Verily we have traveled a long way since Bunker Hill. We have some consolation. That same force—the human mind—which fashions the horrors of war, can with more humane motives be expected to create ways and methods to repair the damage wrought,—developments which will endure when war will have been silenced. Such is the unending work of the physician and surgeon in war and peace.

IN MEMORIAM*

M. D. HARGROVE, M. D.
SHREVEPORT, LA.

Each year our program has a designated place for a memorial service for those of our profession who have passed away during the year. As Shakespeare has said:

> "Death, a necessary end, will come
> When it will come."

and thus it is, that the career of 33 of our members has come to a close.

Life, after all, covers a relatively short time, only a few years. Short indeed, to accomplish the many things that most of us hope to accomplish. Physical development comes early and with less effort so that the majority of us attain that end. Mental and spiritual development, though, are products of the mind and soul and can only be attained by prolonged and consistent effort. But, if pursued diligently, there is no limit to our possible achievements in mental and spiritual growth.

Doctors, as a class, are peculiarly situated to pursue that mental and spiritual development. Practitioners of a profession that still has many unsolved problems, many mysteries yet to unravel, we should be tempted to the highest mental growth; contacts with a varied group of people under circumstances that should afford us the greatest opportunity for spiritual achievement. If we are to be truly doctors, worthy of the name and of that beautiful eulogy of Robert Louis Stevenson, in which he sets us apart, then most diligently must we pursue the rainbow of mental and spiritual growth.

These, whom we honor, have done that and by their efforts have enriched our profession and the lives of those with whom they came in contact. Some of them attained enviable places in our profession and all of them enriched many lives in the pursuit of

*Memorial address read before the sixty-second annual meeting of the Louisiana State Medical Society, April 21, 1941.

their art. Their passing has brought sorrow to all of us, but it should also make us the more resolved that they and the others who have gone before shall not have labored in vain. We should be the more resolved to dedicate our lives to our profession, the noblest of them all, to the end and that it may remain free and may continue to increase in usefulness to our people.

Those of our members who have passed away since we last met are:

NAME	ADDRESS	DATE OF DEATH
Isaac N. Adams	Pineville	1941
Jos. C. Allgood	Summerville	1940
Marie O. Becnel	New Roads	1940
Margaret P. Bowden	New Orleans	1940
S. M. Brian	Winnfield	1940
Jos. F. Cazayoux	New Roads	1940
John A. Devron	New Orleans	1940
John E. DiGiglia	Lake Charles	1940
Jos. A. Estopinal	New Orleans	1940
Jos. L. Ewing	Shreveport	1941
William H. Floyd	Jena	1940
Thos. C. Foreman	Baton Rouge	1940
F. R. Frazar	Merryville	1941
Homer H. Gates	Franklin	1940
Wm. H. Hamley	Lake Providence	1940
A. A. Keller	New Orleans	1940
F. J. Kinberger	New Orleans	1940
J. M. Koelle	New Orleans	1940
John W. Lamon	Montegut	1940
John A. Lanford	New Orleans	1940
A. L. Levin	New Orleans	1940
Royal L. Love	DeRidder	1940
Wilkins McDade	Minden	1940
Henry E. Menage	New Orleans	1940
C. S. Miller	Jackson	1940
James C. Parrott	Montrose	1940
B. B. Reynaud	Baton Rouge	1940
G. D. Sagrera	Arnaudville	1940
Hubert S. Smith	Thibodaux	1940
Robert M. Smith	Gonzales	1940
Oliver C. Teagle	Campti	1940
Guy Wimberly	Ringgold	1940
William L. Wise	Chopin	1940

"God's finger touched him and he slept."
Tennyson—In Memoriam.

SYMPOSIUM ON RECENT ADVANCES IN VITAMINS*

CHEMISTRY OF VITAMINS

ARTHUR O. KASTLER, Ph. D.†
NEW ORLEANS

Everyone is familiar with the fact that all the known vitamins have been discovered as the result of specific pathologic conditions which develop in man or experimental animals when certain factors are absent from the diet. The addition of these organic "accessory substances" to the deficient diet, in amounts so small they could not possibly affect the calorific value or indeed the fat, carbohydrate or protein content of the foodstuff, was shown to prevent or to cure the particular abnormality. With little or no knowledge of the chemical character of the potent materials, each was assigned an arbitrary alphabetical name and was known in terms of its solubility, or as the anti-substance for the prevention of a well-characterized syndrome. Food sources were evaluated in terms of units representing biologic response of test animals to the substance in question.

With the comparatively recent knowledge of the precise chemical structure of at least ten vitamins that have now been synthesized in the laboratory, it has become possible to be more specific, and not only to refer to a chemical individual, but to express its content in various foodstuffs, its daily requirement and its possible administration in concentrated form in the exact terms of milligrams of the pure product.

Minute amounts of these chemical individuals are extraordinarily potent. Vitamin A, for example, isolated from large quantities of cod liver oil, is so effective in the body that a single ounce of the crystalline synthetic material would be a supply sufficient for an average individual's lifetime, and others are comparable. The daily requirement is therefore only a matter of milligrams. While some species seem able to synthesize several of the vitamins, with the possible exception of vitamin D, the human requires the intake of small but definite amounts of each of them at rela-

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*Read before the Orleans Parish Medical Society, November 11, 1940.

†From the Department of Biochemistry, Tulane University of Louisiana.

tively short intervals of time. The possibility of injury from overdosage with vitamin-rich foods has been extensively studied, and there is general agreement on the point that there is no danger of overdosage from natural foods, in which the vitamins occur in only a few parts per 10 million, or from a reasonable use of pure vitamin supplements up to at least one thousand times the protective requirement.

Some idea of the physiologic importance of vitamin substances which supply chemical configurations not found in ordinary purified foods and not manufactured *in vivo*, is obtained by mentioning their close chemical relationship to some hormones, and their wide distribution in cellular enzyme systems, especially those concerned with oxidation-reduction mechanisms.

In discussing the vitamins, it is necessary to consider them one at a time, for there is little true chemical relationship between them that permits of their accurate classification. Vitamins A, D, E and K are among the so-called fat-soluble ones, while vitamin C and members of the B complex are water-soluble.

VITAMIN A

Vitamin A, the fat-soluble anti-xerophthalmic substance, has been shown to be related to the yellow pigment carotene. The vitamin itself, though its chemistry has been definitely worked out, has been assigned as yet no chemical name. It is a cleavage product of any one of four related plant pigment precursors, is an unsaturated alcohol of high molecular weight, and is colorless. As the free vitamin it is rather easily destroyed by oxidation and by light, so it is not suitable in this form for purposes of standardization, although it has been crystallized with a potency of 3,000,000 units per gram. In natural sources the vitamin is relatively stable, for it is combined with fatty acids in ester form. Six tenths microgram (millionth of a gram) of beta carotene, a more stable precursor, is accepted as the International unit, the adult requirement being 3000 units, or 2 milligrams, per day, which amount could be furnished by about 5 grams of cod liver oil. Milk, eggs, liver and green vegetables are among its better dietary sources.

VITAMIN D

Vitamin D, the anti-rachitic agent, has been prepared from natural sources in crystalline form and though its chemical structure is definitely known, it has not as yet been synthesized from its elements in the laboratory. There are several substances with varying degrees of antirachitic value that differ only slightly from each other and from cholesterol in points of unsaturation or length of side chains. They are all sterols that have been given their vitamin properties by "activation" by chemicals or by ultraviolet light, which serves to rupture a bond in one of the four rings in the complex sterol molecule. The two most important members of this group are calciferol (D_2) that is produced by irradiation of ergosterol of plant origin, and D_3 by similar treatment of the animal product 7-dehydrocholesterol. The International unit is 0.025 microgram of calciferol, and the daily requirement for an adult is about 500 units or 0.01 milligram, which is considerably less than that of the other vitamins. This amount would be found in 6 grams of U. S. P. cod liver oil or in 0.5 gram of halibut liver oil. Most common foods contain a scarcely detectable amount. Some foods acquire anti-rachitic potency when exposed to ultraviolet light, and there are on the market foods that have been fortified by the addition of synthetic potent sources. The individual, also, is capable of synthesizing his supply from body sterols when sunlight or some other source of ultraviolet light is available and used in suitable amounts.

VITAMIN E

Vitamin E, the rat anti-sterility vitamin, has been shown to be any one of three closely related substances called tocopherols. These are di-cyclic alcohol compounds with a sixteen carbon atom unsaturated side chain. They are stable to heat, acid and alkali, but are sensitive to light and destroyed when the fat in which they are found dissolved becomes rancid. The alpha-

tocopherol has the greatest vitamin potency of the three, and it has been crystallized and synthesized in the laboratory. It is found widespread in most natural foods, particularly seeds and green vegetables, so its value in human nutrition is difficult to define, and there has been no report of daily requirements. Most workers are still skeptical of the claims for vitamin E therapy, though, since it is now commercially available, there have been some reports in which it was claimed to be effective in the cure of clinical degenerative diseases of the muscular and nervous systems.

VITAMIN K

Experimental chicks and geese show a prolonged clotting time when certain dietary factors are withheld in the course of nutritional studies. A fat-soluble substance, vitamin K or anti-hemorrhagic vitamin, that had previously escaped recognition was shown to be deficient in the diet. Relatively crude preparations of this substance were found to be effective in human cases in which the clotting time was considerably elevated coincident with a lowered blood prothrombin level. Pure forms of vitamin K have been isolated from alfalfa leaf lipids and from bacterial fat fractions, while several compounds having high vitamin K activity have been synthesized in the laboratory. The type of structure has been shown as a methyl naphthoquinone (two fused benzene rings) with a side chain which is very long in the natural vitamin. Shorter side chains and substitution groups in the synthetic compounds do not materially affect the physiologic properties, but render the substance water-soluble, which permits its administration without the bile salt feeding necessary for the absorption of the fat-soluble natural product. Egg yolk, meat fat, liver and green vegetables are some good dietary sources. Phthiocol, which was one of the first pure compounds identified with antihemorrhagic function, was isolated a number of years ago as a yellow fatty material from tubercle bacilli. The vitamin is destroyed by acid, alkali and oxidizing agents, but is stable to light and heat. It is apparently not required by all animals, being synthesized by certain intestinal bacteria.

VITAMIN B COMPLEX

The original water-soluble vitamin B of Funk[1] was soon shown to be multiple in nature and gave rise to the term B complex. Water extracts of yeast or liver were found to contain, among other things, a heat-labile fraction called B_1 which was associated with the integrity of nerve tissue, and a heat stable fraction called B_2 that did not affect anti-neuritic symptoms, but was associated with growth and with the prevention or cure of pellagra in man and black tongue in dogs. This B_2 fraction has itself been found multiple, its principal division being B_2 or G, a P-P factor, and B_6, all of which have now been chemically identified.

There is biologic evidence for six or seven other vitamin B fractions than those already named, which, while not having been shown necessary in human nutrition, are concerned with the growth and well-being of chicks, rats and pigeons. With one exception, chick anti-dermatitis factor or panthothenic acid, their chemical compositions are still unknown.

Vitamin B_1, the anti-neuritic or anti-beri beri substance, is now known to be the material, described by the original term "vitamine", that Funk crystallized in 1911. The crystals were not pure, and in spite of consistent endeavor in various laboratories, the actual isolation of the pure vitamin was not accomplished until fifteen years after Funk's discovery. Even then it was obtained only in minute amounts not sufficient for study, and it was not until 1936 that its structure was discovered and its synthesis accomplished. The compound is called thiamin and is a double ring structure. One ring contains nitrogen and sulfur which together with carbon atoms form a five-membered (thiazole) ring found in no other substance in nature, while the other ring is the familiar pyrimidine nucleus found in uric acid and other compounds, but which in thiamin has side methyl groups in unusual positions. It is the presence of these uncommon structures that made the identification of the com-

pound difficult over so long a period of time. It is the only vitamin that contains sulfur, whence its name, and it is not directly related to any other sulfur-containing compound now known in the body. Thiamin is made commercially and sold as the thiamin hydrochloride salt. It is comparatively stable towards dry heat, but is destroyed by autoclaving and by sulfite. The International unit of B_1 is equivalent to 3 micrograms of thiamin hydrochloride, and the daily adult requirement is 300 units or about 1 milligram of the vitamin. It is fairly widely distributed in foods, good dietary sources including milk, whole cereals, potatoes, vegetables and meat.

Thiamin combined with phosphoric acid is a constituent of co-carboxylase, an enzyme of wide distribution throughout the body, that is concerned in the oxidation of carbohydrates. It is, without doubt, fundamentally important for cellular metabolism, as evidenced by the fact that it has growth-stimulating effects, not only on animals, but on yeasts and green plant roots.

Riboflavin (vitamin B_2 or G) has been crystallized and is now available in large quantities. It has been shown to be a complex three ring pyrimidine derivative with a carbohydrate side-chain. It is the naturally occurring yellow pigment of milk, hence sometimes called lactoflavin, and is bleached and destroyed by exposure to blue light and by alkaline media. It has a characteristic green fluorescence when dissolved in water, and is converted by strong reducing agents into a colorless form from which it can be easily oxidized again by shaking with air. Riboflavin occurs generally distributed in the body tissues, combined with phosphoric acid and protein as the yellow respiratory enzyme of Warburg, and deficiency in humans has recently been associated with cheilosis, a morbid condition of the lips and corners of the mouth. One unit is equivalent to 2.5 micrograms of riboflavin, and the daily adult requirement is 450 units or 1.1 milligrams of the pure vitamin. Good dietary sources of riboflavin include milk, liver, eggs and green vegetables.

The anti-pellagra or P-P factor of the vitamin B_2 complex has been shown to be nicotinic acid or its amide derivative. The discovery of its efficacy in black tongue of dogs by Elvehjem[2] in 1937 was immediately carried over to clinical practice on pellagra when Spies[3] and others reported striking cures with nicotinic acid or its amide within a very short time following the reports on dogs from the Wisconsin laboratory. Nicotinic acid is now made on a commercial scale. It is a comparatively simple substance, consisting of a single six-membered ring containing nitrogen, which thus makes it a derivative of pyridine. The side chain acid group readily forms the amide by combination with ammonia. The name is derived from its early preparation from nicotine by vigorous oxidation in the laboratory. Nicotine itself is, of course, highly toxic in contrast to its vitamin offspring, and the body is unable to make the conversion to the vitamin that can be accomplished in the test tube. Lean meat, liver, milk, eggs and greens are good natural sources, but corn is deficient in nicotinic acid as compared with such other grains as wheat and rice. This probably accounts for the persistent attempts in the past to link pellagra incidence with spoiled corn. Some authorities feel that 15 to 25 milligrams of nicotinic acid per day are required to protect against pellagra, while 500 milligrams was considered a safe curative daily dose. The presence of combined nicotinamide in certain co-enzymes concerned with tissue oxidation reactions has been definitely established.

Vitamin B_6 is the third important member of the original heat-stable B_2 complex and was termed the rat anti-dermatitis factor. It is now believed necessary for the utilization of unsaturated fatty acids. A detailed procedure for the isolation of the vitamin was published in 1938, its structure was almost immediately found and confirmed by a number of workers, and it was synthesized in 1939 by Harris and Folkers[4], indicating the rapid pace of the vitamin chemistry at the present time. It is a single pyridine ring, like nicotinic acid, but with

three substituted alcohol groups instead of the acid side chain. Although thus related, nicotinic acid and B_6 are not interconvertible. Because of its chemical structure, the term pyridoxin has been suggested to replace the older B_6 or adermin (anti-dermatitis vitamin). Good dietary sources include wheat germ, egg yolk, lard and liver, from which the crystalline preparation is now being made in relatively large quantities. Rats when given 3 to 5 micrograms per day are regularly cured of the dermatitis (and acrodynia), and Spies[5] has administered as much as 50 milligrams of synthetic pyridoxin to neuromuscular patients with dramatic results.

The last vitamin of the B complex whose structure is definitely known is panthothenic acid. This has been identified as the active principle in one of the less well defined fractions and is a general growth-promoting substance or bios, the so-called filtrate factor or chick anti-dermatitis vitamin. Recently (1939) the chemical structure of panthothenic acid has been worked out and the substance synthesized by Williams and Weinstock.[6] Its composition shows it to be a peptide-like union of beta-alanine, which is relatively rare, and a six-carbon chain dihydroxy acid. Its stability and widespread distribution in most foods eaten by man suggest there will not likely occur a significant shortage of the vitamin in human dietaries.

VITAMIN C

Vitamin C is the anti-scorbutic substance and though there has been ample evidence for over a century that there was something in fresh fruits which would prevent or cure scurvy in man, it has only been in comparatively recent years that anyone has entertained the idea that this "something" was a definite chemical substance capable of being isolated. The pure principle is now known in crystalline form, and has been made in the laboratory in a series of reactions that start with glucose. It is now available on a commercial scale. The vitamin is ascorbic (or cevitamic) acid, which is the relatively unstable lactone form of an unsaturated six-carbon atom acid. It is related to the simple sugars. One International unit of vitamin C is equivalent to .05 milligrams of ascorbic acid, and the daily adult requirement is 1000 units or 50 milligrams, which corresponds to about 100 c. c. of orange or lemon juice. Other good dietary sources include nearly all the green vegetables. When these are dried or cooked in air, however, much of the vitamin is lost in the liquid or destroyed by oxidation. The vitamin is very sensitive to alkalies and to oxidation, especially with copper catalysis. It is a strong reducing agent and takes part in oxidation-reduction mechanisms in the body tissues in which it is almost universally present. It can be determined in solution by titration with an indophenol dye.

Within recent months newly discovered applications of synthetic vitamins indicate their greater general usefulness. Chemical manipulation of structure by substitution of groups in the naturally-occurring forms of the vitamins has, in some cases, increased the potency of the synthetic compound, and in other cases has altered the physical properties to meet definite demands without materially affecting the biologic activity. It has been suggested that processed foods be restored to their natural potency by inclusion in the refined product of the now commercially available vitamin removed in manufacture. The addition of riboflavin and thiamin to white flour is a case in point. Vitamin A, because of its content in the visual purple of the retina, exerts a beneficial effect on the sight of workers in colors and exact dimensions. Vitamin C, because of its strong reducing activity, prevents rancidity in fatty emulsions like butter and mayonnaise, to which orange juice could not well be added in quantities sufficient to produce the desired result. Vitamin B_1 is being used in infinitesimal concentrations (1 part in 10 billion) for the more luxurious growth of flowers and for crops on irrigated desserts. Further, injection of the pure thiamin has been reported a promising remedy for certain types of nervous tics, and for the alleviation or prevention of serum sickness.

SUMMARY

The important point is that of less than twenty presently known vitamins, at least ten have been synthesized, three within the past two years. This on the one hand has provided proof of their chemical constitution, and on the other has placed powerful agents into the hands of the medical profession.

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MEDICAL ASPECTS OF VITAMIN THERAPY

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NEW ORLEANS

VITAMIN A

The discovery nine years ago that the reddish plant pigment carotene is converted in the body to vitamin A[1] and the elucidation of the chemical configuration of beta-carotene and vitamin A[2, 3] proved a remarkable forward step in our knowledge of the physiology of vitamin A. Beta-carotene is the most important and widely distributed of the known natural coloring matters which have vitamin A activity. Since the animal organism cannot synthesize vitamin A or carotene it is dependent upon its food supply for these substances. The factors which influence the absorption of vitamin A and carotene from the gastrointestinal tract are therefore worthy of some consideration.

It should be borne in mind that carotenes are hydrocarbons, whereas vitamin A is an alcohol. This difference has a definite bearing on the absorption of these substances from the gastrointestinal tract. Drummond, Bell and Palmer[4] studied the absorption of vitamin A and carotene from the intestinal tract of a patient with a fistula leading from the thoracic duct to the pleural cavity. They showed[1] that if the free alcohol vitamin A is given it is recovered in esterified form, and that nearly all administered vitamin A and only small amounts of the administered carotene may be recovered. These key observations indicate: (1) that absorption of vitamin A may depend on esterification in the intestinal wall. (Naturally occurring vitamin A is in the esterified form whereas in preparations made by saponification the vitamin exists as the alcohol); (2) that carotene being a hydrocarbon cannot undergo esterification and is more poorly absorbed.

The administration of liquid petrolatum preparations has a slight effect in reducing the absorption of vitamin A but markedly reduces carotene absorption since the petrolatum competes with solvent action of natural fats.[5] Experimental evidence[6] indicates that rats on fat-free diets assimilate only a small fraction of the carotene absorbed when the diet has 10 per cent fat. It also appears that bile salts play a role in the absorption of carotene.[7] Vitamin A however is apparently fairly well absorbed under the above conditions.

For some unknown reason, both carotene and vitamin A are poorly absorbed during infections.[8] It is not surprising that deficiency of vitamin A in spite of "adequate intake" may occur in a variety of intestinal disorders such as chronic diarrhea, steatorrhea, celiac disease, obstruction of the biliary ducts, pancreatic dysfunction. In such instances carotene absorption may be completely inhibited and assimilation of vitamin A greatly reduced.

Most of the well-known changes due to severe vitamin A deficiency are dependent upon a keratinizing metaplasia of epithelial structures. The earliest evidence of vitamin A deficiency is a functional change, namely a decreased ability for dark adap-

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tation. Among the best known disorders, in addition to nutritional night blindness, are xerophthalmia, keratomalacia and a follicular dermatosis.

Tests for loss of adaptation to dim light have been recently introduced as a measure of deficiency of vitamin A. Vitamin A apparently takes part in a cycle of events which occurs when the retina is exposed to light; the rate of reformation of visual purple seems to depend on the available supply of vitamin A.

Hart, Mead and Guilbert[9] have supplied evidence to show that night blindness only ensues when the vitamin A stores of the liver are practically exhausted.

While the methods used to determine dark adaptation are rather tedious and fraught with error, they approximate the accuracy of other biologic methods and serve as crude indicators rather than absolute measures.

In view of the above considerations an amount of vitamin A which will prevent hemeralopia might be regarded as just short of a minimum requirement. Friderichsen and Edmund,[10] Jeans and his coworkers,[11] Jeghers and others[12] indicate that the daily requirement of vitamin A is about 30 units per kilo of body weight per day or about 2000 units per day. Three thousand units per day is probably safer. This requirement can be satisfied by a pint of milk, one egg, one ounce of butter and one serving of green leafy vegetable daily. It appears that the requirement of children and infants is two or three times greater. The Technical Commission of the Health Committee of the League of Nations recommends that all children between the ages of two and 14 should have an additional pint of milk and 3.0 gm. cod liver oil daily.[13] This dietary intake should supply 6000 to 8000 units of vitamin A daily for growing children. Pregnant and nursing women require about 6000 units daily.

The above requirements are physiologic. In disease states the requirement will vary from case to case. The current active correlation of dark adaptation tests and blood carotene and vitamin A levels holds promise of meeting the clinician's needs for estimating the vitamin A requirements in disease states.

Potent vitamin A preparations for parenteral administration are now available and in critical cases may adequately supplement the inefficient oral therapy. More data are needed on the rate of depletion of vitamin A in humans, the efficacy of single large parenteral doses in repleting body stores before accurate therapeusis can be rationally employed. It would appear from Jeghers' work,[12] however, that an assured daily absorption from the gastrointestinal tract or subcutaneous tissues of 10,000 units should replenish body stores and take care of most patients' requirements.

Treatment with vitamin A has also been suggested in disease states which are not primarily dependent upon a vitamin A deficiency, for example, local treatment of skin wounds, thyrotoxicosis, or urinary lithiasis. A consideration of these problems is beyond the scope of this paper.

VITAMIN B COMPLEX

Four of the fractions of the vitamin B complex are now available in crystalline form for therapeutic use. These include thiamin, riboflavin, nicotinic and vitamin B_6. The advent of these pure compounds is serving a twofold purpose. It is calling for a critical re-evaluation of experimental and clinical phenomena associated with deficiency of the various vitamin B fractions, and is supplying the clinician with the means of treating specific deficiencies with pure compounds. It is not unreasonable to assume that a deficiency in one fraction of the vitamin B complex may be associated with a deficiency of other factors of the B complex. Among the legion signs and symptoms attributed to thiamin deficiency is the onset of anorexia and gastrointestinal disturbances. Accordingly, deficiency of thiamin may reduce the intake and absorption of other B factors.

Thiamin forms part of the cocarboxylase system responsible for the oxidation of pyruvic acid—an intermediary in carbohydrate metabolism. In thiamin deficiency, lactic and pyruvic acids are known to accumulate in tissues.[14] Since carbohydrate

metabolism supplies most of the energy for nerve and muscle metabolism, thiamin deficiency causes a biochemical block which is probably as effective as a partial anoxia. In muscle this may produce pain entirely like that caused by ischemia. Thiamin deficiency in animals presumably produces a similar block in all tissues, but the symptoms are most striking in the central nervous system. Incoordination and opisthotonus are produced in a matter of days. These manifestations occur without peripheral neuritis and have been erroneously labeled polyneuritis. Their striking relief by thiamin administration has allowed clinicians to assume that thiamin is the anti-neuritic vitamin. Actually there is no proof at present that thiamin deficiency alone produces the anatomic changes of the true peripheral neuritis in animals; in addition, there is no proof that it will cure a true peripheral neuritis induced by nutritional deficiency due to insufficiency of factors other than thiamin.

Human beriberi is a symptom complex involving cardiovascular phenomena, muscular symptoms, central nervous system, and peripheral nerve symptoms. It is generally agreed that thiamin will rapidly correct cardiovascular,[15] muscular and acute central nervous system manifestations. Relief is striking and rapid—suggestive of correction of a functional rather than an organic disorder (remedying the faulty carbohydrate metabolism). In mild cases of nutritional deficiency the muscle pain, tenderness and weakness may predominate the picture. Their presence is not to be confused with a true polyneuritis involving organic changes in peripheral nerves. The evidence that nutritional peripheral neuritis may be due to other factors than thiamin deficiency alone is weighty. Peripheral neuritis has been produced on diets adequate in thiamin, but lacking in other factors of the B complex.[16] Peripheral neuritis has been produced by vitamin A deficiency.[17] Diets low in vitamin B_1 are low in other factors of the vitamin B complex. Deficiency of thiamin is accompanied by nausea and gastrointestinal disturbances which mitigate against adequate intake and absorption of other vitamin B factors. The clinical conditions of pregnancy, alcoholism and gastrointestinal disturbances which give rise to thiamin deficiency, also give rise to deficiency of other vitamins. Controlled observations on thiamin therapy in peripheral neuritis fail to give conclusive objective evidence of amelioration of the neuritis unless other factors are included in the diet. Most clinical reports purporting to show clinical improvement of the neuritis with thiamin are based upon observations showing relief of muscle pain and weakness associated with polyneuritis. There is little or no clear cut evidence to show regression of the objective symptoms when thiamin alone is used. The fact remains that thiamin does not fill the role required for the antineuritic vitamin. It is not unlikely that nutritional peripheral neuritis is a multiple vitamin deficiency involving several factors of which thiamin is one. Meiklejohn has recently published a fascinating analysis of the evidence for and against this view;[18] the following is an abstract of that evidence.

"The polyneuritis associated with alcoholism, pregnancy and gastrointestinal disturbances is unquestionably due to nutritional deficiency, and it is in every way similar to the polyneuritis of Oriental beriberi. It has not been demonstrated that this polyneuritis is due to deficiency of thiamin alone. For this reason it is of paramount importance that the treatment of nutritional polyneuritis should include an ample and nutritious diet together with the administration of potent sources of the vitamin B complex, including such substances as yeast and liver extract. Additional thiamin is of value in the relief of the cardiovascular disturbances and muscular symptoms which may accompany the nutritional polyneuritis."

Two years ago Sebrell and Butler[19] first described the characteristics of riboflavin deficiency in man. Since then, Spies and his co-workers[20] have reported forty patients with similar lesions, mostly endemic pellagrins. The lesions characteristic of

riboflavin deficiency consist of skin and mucous membrane lesions. The skin lesions are filiform excrescences showing a fine, greasy, scaly desquamation. These excrescences may be found chiefly at the nasolabial folds, at the angles of the mouth, at the alae nasi, and on the forehead. Lesions at the angle of the mouth are usually symmetrical and bilateral and extend laterally and inward on the mucous surface of the mouth. They are shallow and show no increased redness.

Pure riboflavin deficiency is a rare occurrence. Riboflavin deficiency occurs in patients who have a deficiency of one or more factors of the vitamin B complex. Treatment may be started with the administration of pure riboflavin in doses of 15 mg. daily for three days, followed by a maintenance level of 10 mg. daily for a few more days. Complete healing of lesions should be noted within 48 to 72 hours after the administration of adequate therapy.[21] It is advisable to maintain the patient on one or two milligrams of riboflavin daily for several weeks, and when the diet is adequate therapy may be discontinued.

The signs and symptoms of nicotinic acid deficiency have been adequately described by Spies, et al.[20, 22] These symptoms include involvement of several systems: (1) Gastrointestinal lesions, including (a) oral lesions —scarlet red stomatitis, glossitis, ulcerations on the floor of the mouth, (b) inflammation of all mucous membranes and the incidence of severe diarrhea; (2) skin lesions, consisting of a characteristic bilateral symmetrical dermatitis, and (3) mental changes, which may be severe and acute, comprising the nicotinic acid deficiency encephalopathy described by Jolliffe,[23] or mild and chronic. It should be understood that the symptoms of nicotinic acid deficiency may occur alone or in any possible combination of systems. Patients showing primarily mental changes before the skin and gastrointestinal changes might easily be labeled as psychoneurotic. Similarly a stomatitis caused by nicotinic acid deficiency with secondary involvement by Vincent's infection may have the diagnosis obscured by the superimposed infection.[24]

The role of vitamin B_6 in human nutrition is still obscure. There is evidence that it may be of some importance.[25]

Marked deficiency of vitamin B complex factors is evidenced in pellagra. When the deficiencies are associated with gastrointestinal lesions it is not unreasonable to include in the therapy rather large doses of all of the B vitamins. During acute phases of gastrointestinal disturbances liquids should be resorted to, chiefly milk, beef juice and broth. With continued improvement of the gastrointestinal tract under the influence of the B vitamins, the diet should rapidly be stepped up to a full diet. Of prime importance for inclusion in the diet are milk, yeast, ground liver, pureed vegetables, thin whole grain cereals and fruit juices, administered orally in hourly feedings or through a nasal catheter if necessary. Supplementary vitamin preparations should include about 50,000 International units of vitamin A daily, 200 to 500 mg. of vitamin C (depending upon the vitamin C requirements), and a rich source of vitamin B complex; 30 to 60 grams of brewers' yeast daily is a splendid source of vitamin B complex as is 30 grams of aqueous liver extract. It should be clear that the administration of pure vitamin fractions of the B complex should be restricted for specific syndromes occasioned by their absence. For this purpose acute circulatory manifestations of vitamin B_1 deficiency may be treated with immense doses of thiamin hydrochloride, 500 to 1000 mg. intravenously and intramuscularly during the first 24 hours and from 200 to 500 mg. daily intramuscularly in two doses daily for a week. Following this the thiamin may be reduced to about 10 mg. daily until convalescence is well established. Riboflavin should be given in doses of 10 to 20 mg. daily by mouth during the acute phases and later reduced as indicated. In nicotinic acid specific deficiency, 100 mg. daily for ten days should be adequate, and in cases of encephalopathy due to nicotinic acid deficiency 200 mg. of sodium nicotinate may

be administered parenterally. It should be remembered however, that in mild cases of pellagra, dietary adjustment is all that may be necessary.

VITAMIN C

The volume of literature recently written on vitamin C has assumed gigantic proportions. The advent of relatively easy methods for the estimation of vitamin C in food sources, body fluids and excreta has greatly stimulated work in this field and fairly complete data are now available.

Wright and Ludden[26] have supplied methods which test the ability of the patient to absorb orally administered vitamin C and indicate the saturation of the body stores with vitamin C. Such methods are fundamental requirements for adequate treatment of patients with a variety of diseases influencing absorption and utilization of vitamin C.

Vitamin C deficiency may occur under a variety of conditions even when the intake is apparently adequate. The clinical indications for administration of vitamin C are extant when scurvy or subclinical scurvy is present, or even where the physician may anticipate danger of a deficiency of this substance whatever the complicating circumstances may be. A determination of the saturation index is the best method of estimating the efficiency of vitamin C intake and therapy. While of considerable value, single blood estimations for vitamin C may give an erroneous picture of the body stores for this level is affected by the vitamin C intake of the previous 24 to 48 hours and upon renal retention of vitamin C.

The normal daily requirement for vitamin C is 30 to 60 mg., an amount contained in 100 c. c. fresh orange juice. This requirement is greatly increased in infectious diseases with or without fever,[27, 28, 29] any protracted diarrhea, achlorhydria, or ulcer diets. In fact, the oral requirement may be as high as 1000 mg. daily to maintain saturation of body stores.[26] Saturation of the body stores of a depleted patient requires about 15 grams given over three to five days in divided doses, followed by 100 to 200 mg. daily by oral or parenteral route. These huge doses may be given orally as citrus fruits. In the event of uncertainty as to absorption the parenteral route is safest.

The phenomena associated with vitamin C deficiency are almost entirely dependent upon rupture of blood vessels. For this reason, and the fact that it appears early, the capillary fragility test of Gothlin is widely used as an indicator of vitamin C deficiency. It should be remembered that numerous other conditions affect the fragility of capillaries. The test is of some value however, for if capillary fragility is caused by vitamin C deficiency, the fragility will disappear very promptly upon the administration of adequate amounts of vitamin C.

With obvious evidence of the presence of a vitamin C deficiency and lacking the facilities for study of the status of vitamin C metabolism, saturation with the vitamin and maintenance of adequate intake should be undertaken.

VITAMIN D

The medical therapeutics of vitamin D resolve themselves into prevention and treatment of rickets and treatment of parathyroid tetany. Of the numerous vitamin D preparations, three are of clinical importance: calciferol, dihydrotachysterol (A. T. 10) and 7-dehydrocholesterol.

Calciferol (viosterol, vitamin D_2) is derived from irradiation of the plant sterol ergosterol. Dihydrotachysterol is a derivative from the same source; 7-dehydrocholesterol (vitamin D_3) is derived from the irradiation of the animal sterol cholesterol or by the action of ultraviolet light on the cholesterol in skin.

For the prevention of rickets and infantile tetany in the average case the dose of 200 to 400 units daily is gradually raised from the third week to about 1200 units daily by the third month, and maintained at that level for the first year. It may be reduced to 800 units daily during the second year. In prematures and susceptible infants the dose required to prevent rickets may be as high as 30,000 units daily. The best check on the possible appearance of rickets is a routine x-ray study of the

radius and ulna and estimations of the serum levels of calcium and phosphorus.

For the cure of rickets, doses from 2000 to 60,000 units may be needed. The criteria of cure are a rise in the inorganic phosphorus and x-ray changes showing progressive calcium deposition (three weeks if therapy is adequate). In cases of infantile tetany the same rules hold as for rickets and it is best to supplement the vitamin D with about 1 gram four times a day of calcium chloride to prevent the drop of serum calcium which sometimes ensues when vitamin D therapy is started.

In the treatment of refractory rickets immense doses may be required, as much as 1,000,000 units daily.[30] Albright states that 150,000 units may be needed to maintain a normal state. Most cases however yield to doses of 50,000 to 60,000 units per day. It is obvious from the above that a wide range of dosage is employed and pure preparations of high potency are of importance from the standpoint of ease of administration. Cod liver oil contains only 100 units per gram or 400 to the teaspoonful. For small intakes it is adequate. Viosterol however contains about 10,000 units per gram and acts as a splendid supplement. There appears to be no significant difference in efficacy between animal and plant vitamin D.[31]

The recent preparation of pure vitamin D products has made it possible to use much higher doses with comparative safety. Formerly toxic effects, for example metastatic calcification, were obtained with mixtures of irradiation products marketed as vigantol. Furthermore these researches have yielded dehydrotachysterol which is proving of tremendous value in the control of hypoparathyroid tetany. Less than 1 c. c. daily of this preparation has rendered obsolete the former measures employing large doses of calcium, parathyroid hormone, intravenous medication and the use of acidifying salts. The product should not be used however, without adequate serial observations on the serum calcium level.

While Harnapp's[32] single massive dose method (600,000 units) for the prevention and control of rickets has met with favor in Europe, it has scarcely been adopted by American clinicians. The prophylactic effect is said to last for several months and to be free from danger.

When large doses of vitamin D are employed care must be taken to guard against toxic effects. Toxic effects should not appear when the rickets show no sign of healing. Anorexia, nausea, pallor, lassitude—symptoms suggestive of hypercalcemia may be noted. Poisoning without hypercalcemia may occur.

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THE SIGNIFICANCE OF VITAMINS IN SURGERY

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NEW ORLEANS

That surgical entities are frequently accompanied by vitamin deficiencies is well appreciated by most surgeons. An immense field of therapy is becoming exposed due to intense experimental and clinical studies with the use of vitamins. In the light of investigative work, specific deficiency states are for the first time being recognized and dramatically corrected with the use of synthetic vitamin preparations.

It is in the detection of subclinical avitaminosis that difficulty is frequently encountered, for there is a wide margin between the onset of a deficiency and the beginning of characteristic symptoms. Irreparable damage may ensue if deficiencies are allowed to progress.

Each patient must be individualized with regard to supportive vitamin therapy with either surgical or medical management. Ideal therapeutic care does not consist in the use of all inclusive vitamin mixtures nor in the indiscriminate use of the vitamins, but rather in the recognition of specific avitaminosis, either through the means of laboratory facilities or of careful clinical study, followed by properly indicated therapy.

The diet of the healthy individual should be well rounded with thoughtful planning of meals to include foods rich in vitamins. The diet of the postoperative patient should be supplemented with those vitamins which will aid recovery. Occasionally patients have such impairment of bodily functions that proper absorption and utilization of vitamins provided in the diet is interfered with. In such instances most vitamins can be administered parenterally until the body is able once again to assimilate an adequate diet.

VITAMIN A

Whereas most diseases attributable to vitamin A deficiency have little direct surgical significance, there are certain functional disturbances resulting from such a deficiency which indirectly are of surgical importance. Of these, the most signifi-

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cant are the pathologic changes occurring in epithelial tissue, the susceptibility to infection, and the relationship to thyroid function.

It has been clearly demonstrated that the most pathognomonic pathologic features of vitamin A deficiency occur in epithelial structures. These consist primarily of epithelial atrophy followed by reparative proliferation of the basal cells and eventual replacement by stratified keratinizing epithelium. In some instances this process resembles a true metaplasia and involves many epithelial lined structures, such as the respiratory tract, salivary glands, genitourinary tract, the eyes and para-ocular glands, the glands of the gastrointestinal tract, and the pancreas. This process of continuous desquamation of epithelial cells may lead to the plugging of ducts and bronchi. The more serious consequences of such lesions are believed to be bronchial occlusion, atelectasis, and pneumonia. This process has been considered responsible for the frequency and severity of pneumonia in infants deficient in vitamin A. Accordingly, the surgical significance of vitamin A lies in its possible importance as a factor in postoperative pulmonary complications. Of further significance in this regard is the possible role of vitamin A in the resistance to upper respiratory infections. Conflicting reports have appeared concerning the value of this vitamin in the prophylaxis of colds. In this connection, the Council on Pharmacy and Chemistry recently concluded that whereas: "Vitamin A is an aid toward the establishing of resistance of the body to infections in general, it certainly has not been shown to be specific in the prevention of colds, influenza, and such infections." (New and Nonofficial Remedies, A. M. A., Chicago, 1939, p. 484). Two observers[1, 2] have directed attention to the anti-infective properties of vitamin A. It would appear that severe deficiency of vitamin A lowers resistance to infection in general. However, in such poor nutritional states, other factors are involved which may be just as important and the conflicting reports at the present time certainly do not justify considering vitamin A an anti-infective vitamin.

Numerous investigators[1-4] have directed attention to the significance of vitamin A in the treatment of superficial wounds, burns, and ulcers. It has been observed that the treatment of such lesions with cod liver oil dressing stimulates healthy granulation and epithelialization and reduces the infection, whereas similar vitamin-free oils do not produce the same response. Because of these observations, the beneficial effects have been attributed to the vitamin A and D contained in the cod liver oil. Excellent results have been reported in the treatment of burns and infected wounds with ointment containing a high vitamin A content. These beneficial effects have been ascribed partly to a bactericidal influence of the preparation employed, and partly to a stimulation of growth of epithelium. The treatment of acute and chronic osteomyelitis by means of local application of cod liver oil ointment and plaster bandages has been advocated by Löhr[5, 6] as well as the treatment of chronic arthritis by means of injection of cod liver oil into the joint spaces. Others[7] have advocated solutions of carotene in oil for the local treatment of ulcerative colitis. Controlled experimental observations[8] in the use of this form of therapy are somewhat conflicting as regards their value.

It has been shown that there exists an antagonistic action between thyroxine and vitamin A.[9-11] Experimentally it has been demonstrated that the administration of large doses of carotene will prevent the symptoms of hyperthyroidism.[9-14] Moreover, the symptoms of hypervitaminosis produced by unusually large doses of vitamin A could be prevented by the administration of thyroxine. On this basis, it has been suggested that patients with hyperthyroidism might be benefited by the administration of vitamin A. However, Clausen[15] in a recent clinical analysis of these observations concludes that whereas it is reasonable to assume that vitamin A may be more rapidly destroyed in any state in which the metabolic rate is increased, as, for example, in hyperthyroidism, it is diffi-

cult to understand how vitamin A can decrease the activity of thyroxine. Further investigations are necessary before the significance of vitamin A as a therapeutic agent in hyperthyroidism can be accepted.

Because experimentally[16, 17] it has been shown that renal and ureteral calculi can be produced in animals by feeding a diet deficient in vitamin A, it has been assumed that deficiency of this vitamin may be a factor in the production of urinary stones. On this basis, Higgins[16] has recommended the treatment of urinary stones in man by acid ash diet and vitamin A. Other investigators,[18, 19] however, have not been able to show that in man the feeding of such special diets is of value in the treatment of urinary stones. At present, the majority of investigators are of the opinion that other factors are perhaps more important.

The daily requirements of vitamin A are not definitely known but it is generally believed that in adults a safe dose should be about 3,000 to 4,000 International units daily. Of particular interest to the surgeon are conditions which cause increased need or interfere with the intake or absorption of this vitamin. Thus, for example, tuberculosis and hyperthyroidism require an increased intake of vitamin A. In any condition in which the bile is excluded from the intestinal tract, the intake or utilization of carotene or vitamin A is disturbed. Mineral oil also interferes with the absorption of carotene and should not be employed in the presence of vitamin A deficiency.

VITAMIN B

A deficiency of a single component of the vitamin B complex is unusual. When there are symptoms relative to the lack of one factor careful study will reveal evidence of another deficiency. Symptoms of avitaminosis B, such as anorexia, constipation or diarrhea, loss of appetite and weight will occur when the intake or absorption of the vitamin complex is interfered with by lesions of the gastrointestinal tract. Pyloric stenosis, achlorhydria, ulcerative colitis, gastrointestinal carcinoma are conditions which are frequently accompanied or complicated by vitamin B deficiency. In celiac disease, scurvy, carcinoma and ulcer of the stomach, and following gastrectomy, Sinclair[20] has found through quantitative analysis a low vitamin B_1 level. That the reserve of this vitamin is small is suggested by the rapid onset of symptoms when the body is deprived of vitamin B for one reason or another.

The disease resulting from deficiencies of the various components of the complex are not surgical but their manifestations may complicate the picture of a surgical entity. Confusion in diagnosis may arise when vitamin B deficiency results in symptoms which simulate those of surgical lesions of the gastrointestinal tract such as abdominal cramps, diarrhea, nausea and vomiting. Sure and Thatcher[21] found that rats on vitamin B_1 deficient diets develop gastric ulcers in a large percentage of cases but Cowgill[22] believes that inasmuch as the ulcers did not occur in every case the pathology was not due to a specific relation of vitamin B_1 to the stomach.

Cowgill and his co-workers[23] have shown a direct relationship of vitamin B to metabolism. When the basal metabolic rate is increased the need for the vitamin, especially B_1, is also increased and when this demand is great, additional vitamin must be consumed in large amounts to prevent symptoms of a deficiency from occurring. The demand for the vitamin is also increased in the presence of severe infections for the same reason.

Vitamin B_1 deficiency in man may result in tachycardia, palpitation and lowered exercise tolerance. Therefore, an abnormal cardiac state in thyrotoxicosis would be exaggerated by a B_1 deficiency.[24] It is only in the vitamin B_1 deficient patient that the administration of this factor has any beneficial effect on abnormal cardiac function.

Drill[25] observed that loss of weight in hyperthyroid rats was checked by the administration of vitamin B_1 supplemented to the diet but did not gain weight until the entire B complex was added. When anorexia and loss of weight occurred in animals in experimental hyperthyroidism, Hinwich,

Goldfarb, and Cowgill[26] observed that the administration of vitamin B_1 brought about a normal appetite and an increase in weight. In experimental investigations with rats given thyroxin, the toxic manifestations were entirely corrected by the administration of very large doses of crystalline vitamin B_1. The antithyrogenic action was more efficacious if vitamin B complex was used.[27] Frazier and Ravdin[24] believe that gastrointestinal symptoms in vitamin B_1 deficiency and in thyrotoxicosis may be comparable and a B_1 deficiency may attribute to the intensification of thyrotoxicosis. They state that hyperglycemia, decreased glucose tolerance, and depletion of liver glycogen are characteristic manifestations of disturbed carbohydrate metabolism in hyperthyroidism and that this picture is similar to that in a patient with avitaminosis B_1 when the amount of carbohydrate in the diet is very high. In both instances vitamin B_1 must be added in large amounts to the diet to aid in the deposition of glycogen. These authors reported the results obtained after the use of the vitamin B complex in fifty hyperthyroid patients. They consisted essentially in a reduction of the pulse rate preoperatively, a gain of weight, an increase of appetite and a general diminution in the length of the preoperative period. Twenty-eight patients with hyperthyroidism not taking the vitamin B complex served as controls. In this series of cases the vitamin complex had no effect on the basal metabolic rate. Vitamin therapy is of greater necessity in patients with marked toxicity than in those in a moderate state since it is in the former group that avitaminosis is more likely to occur. The authors concluded that adequate amounts of this vitamin are indicated in hyperthyroidism even though vitamin B_1 has no direct antithyrogenic action.

With regard to preoperative preparation the detection and correction of vitamin B deficiency is important in decreasing complications following surgery. Considerable experimental studies have been conducted in order to determine the amount of vitamin B that constitutes a daily minimal intake. The average normal diet is sufficient in vitamin B. The minimal daily requirement of vitamin B_1 is, of course, based upon the weight of the individual and caloric intake (Cowgill[28]) and this is approximately 350 International units per day. However, in the presence of disease in the gastrointestinal tract or in conditions accompanied by an increased basal metabolic rate, the amount of vitamin B needed to prevent symptoms of deficiency is much greater than that required by a normal healthy person. Accordingly, the dosage must depend upon individual requirements. However, large doses are well tolerated and are without contraindications.

VITAMIN C

Vitamin C is not only to be used in the treatment of scurvy but has practical value in the pre- and postoperative treatment of patients having a low vitamin C reserve without manifesting objective symptoms of the deficiency.

In certain conditions in which the metabolic rate is increased such as hyperthyroidism, infections and other febrile diseases and following operations there is an actual increased demand for ascorbic acid. Usually, however, a deficiency in the surgical patient is the result of inadequate intake or faulty absorption of the vitamin. Illustrations of this may be found in patients on inadequate supportive diets as those on prolonged dietary ulcer regimens, in patients requiring intravenous therapy for long periods with exclusion of oral feedings, in patients suffering from prolonged vomiting, obstructive lesions or external fistulae of the gastrointestinal tract, hypermotility of the small intestine, gastric or duodenal ulcers, and gastrointestinal carcinoma, and lesions of the lower bowel resulting in diarrheal states. Kendall and Chinn[29] demonstrated that certain bacteria in the stomach and intestines of patients with achlorhydria destroy ascorbic acid but that this destruction is definitely postponed by even small amounts of dextrose, which is utilized in preference to ascorbic acid.[30]

In active tuberculosis there is diminished excretion of vitamin C and the degree of excretion roughly parallels the extent and

activity of the tuberculous involvement. Large daily doses of ascorbic acid are required to replenish the reserve and keep it at a normal level. Administration of sufficient quantities apparently does not affect the prognosis of the disease. At least 100 mg. of vitamin C daily are necessary to establish a normal blood vitamin C level in the patient with active tuberculosis, whereas one fifth of the amount is all that is required by the normal individual.

A deficiency of vitamin C accompanies osteomyelitis. Abbasy, Harris, and Hill,[31] investigating cases of osteomyelitis, came to the conclusion that in common with other infective conditions, osteomyelitis causes a diminished rate of excretion of vitamin C in the urine and a lowered response to the test dose, indicative of an apparently increased usage of the vitamin during the infectious process. Partially healed cases showed moderately low levels, whereas healed cases had normal levels.

Although the vitamin C reserve may be low in a patient, the deficiency may not be easily recognized because he may remain in an asymptomatic state. Vitamin C determinations may not give a definite indication of the patient's reserve, neither will random determinations indicate saturation.[32] In patients suspected of having a vitamin C deficiency several periodic determinations should be made. The significance of this fact may be demonstrated by the observations of Wolfer and Hoebel.[33] These investigators reported that patients with normal vitamin C blood levels may develop low blood levels following operative procedures, infection or deprivation of vitamin C intake for several days but will respond quickly to administration of synthetic or naturally occurring vitamin C and maintain the normal level on moderate doses. On the other hand, patients with subnormal vitamin C blood levels show sudden elevation following the administration of ascorbic acid but do not maintain this level unless the excessive intake is continued.

The level of vitamin C is more significant when determinations are carried out on blood samples. Abnormally slow excretion of vitamin C in the urine does not necessarily indicate low bodily content if renal function is decreased because renal damage retards excretion even when no deficit of vitamin C exists.[34] There is no constant renal threshold for vitamin C. Excretion of the vitamin by way of the feces is negligible except in hypermotility of the small intestines.

It is important to recognize that nearly half of all patients coming to surgery in free clinics are deficient in vitamin C to a marked degree, and may be in a state of actual or subclinical scurvy. Holman[39] has observed that 44 per cent of free clinic patients, who usually fall in the low income group, are on diets poor in vitamin C and in the series of seventy patients reported, seven were on the borderline of scurvy. All patients above 70 years of age showed a relative deficiency.

Vitamin C deficiency in man, even when it is partial, may be a causative factor in cases of wound disruption.[35] Although Wolfer and Hoebel are of the opinion that there is no absolute proof of the relation of vitamin C deficiency to non-union of wounds in humans, there is considerable evidence to give strong support to this theory. Lanman and Ingalls[36] conducted experiments with guinea pigs on normal and vitamin C deficient diets and found both histologically and physiologically that the healing of operative incisions in vitamin C deficient animals was inferior to the group of control animals. In the scorbutic animals histologic examination showed defective repair of the corium and poor production of collagen in the scar. Vitamin C is necessary for the formation of all intercellular substances having collagen as their basis. A deficiency does not interfere with the growth of cells but it does prevent the formation of structural connective tissue.[38] Vitamin C deficiency does not play the only role in wound healing, but asymptomatic scurvy undoubtedly has an important bearing on wound healing and is more frequent than is generally recognized.

Land[37] made plasma vitamin C determinations before and after operations on

forty-three patients. In nearly every case there was a prompt fall after operation from the original level. In a few cases the level did not begin to rise until four to five days. The author states that a low vitamin C level immediately postoperatively is probably of less significance than a low level preoperatively. A further drop of the vitamin C level postoperatively may be the result of prolonged intravenous therapy without food by mouth, abnormal bowel function, or increased utilization of vitamin C.

Deficiency of vitamin C may be corrected by a diet rich in this vitamin or by the administration of synthetic preparations orally or intravenously.[38] When the blood level remains relatively constant and the urinary excretion is high, saturation is complete. There is no contraindication to large doses of the synthetic product. Preoperatively deficient patients should receive a gram a day and postoperatively a maintenance dose of 300 to 500 mg. per day until the convalescent period is concluded and the patient is once more on a well balanced diet.

VITAMIN D

Experimental evidence does not confirm that the administration of vitamin D in large amounts hastens the healing of fractures where no deficiency of the vitamin exists.[40] However, following fractures in patients on vitamin D deficient diets there is clinical evidence in support of this theory. Attention has been called to the increase in fractures among children during the World War in those vicinities where diets were inadequate and of the relative decrease in the number of fractures when children in these areas were able to obtain sufficient amount of vitamin D in their diets.[4] Compere et al.[42] have shown experimentally that vitamin D deficiency in growing rats if continued long enough to produce active rickets may cause delayed healing or nonunion of fractures. The addition of vitamin D to the diet was found to prevent or to heal rickets and to bring about a more rapid and better healing of the fractures. It was observed by the authors that the administration of vitamin D to elderly patients greatly aided healing of fractures but no effect in the healing properties was noted when the vitamin was given to younger patients with fractures. If patients with fractures are not suffering from acute or chronic vitamin D deficiency, the administration of vitamin D contents may not only delay healing of the fractures but also bring about permanent degenerative changes.

One of the occasional complications of thyroidectomy is parathyroid tetany and the use of vitamin D plus parathormone in this instance is followed with gratifying results. This vitamin allows better absorption of calcium in the diet. In large doses vitamin D may simulate parathormone activity. The means by which the blood calcium is raised in the administration of vitamin D and parathormone is quite different in that the former increases absorption of calcium in the intestines and the latter withdraws calcium from the bones. Parathormone toxicity consists of decalcification, whereas the toxic effect of vitamin D is hypercalcification.[43]

Many clinicians[44-47] have made use of vitamin oils containing vitamin D for the stimulation of wound healing. By this method infection seems to be decreased and the rate of healing increased. Puestow, Poncher, and Hammott[44] in an experimental study on the treatment of burns in rabbits and pigs, showed that in wounds treated with various amounts of vitamin A and D oils, tannic acid, and vitamin free oils, the healing period was shortened by 25 per cent when cod liver oil was used. Vitamin free oil did not increase the healing time. Healing of large burns treated with the vitamin oils was much more rapid than the healing of small burns treated with tannic acid. Vitamin D was used in different amounts both with and without vitamin A and the healing was accelerated. Vitamin D had a definite stimulating effect on epithelialization but excessive doses of this vitamin may produce extreme toxicity and pathologic changes. Löhr[45] has made a great deal of use of cod liver oil dressings in the treatment of burns and other wounds and states that cod liver oil is self sterilizing and that it diminishes the

degree of infection in burns and controls secondary infection when present. He attributes this action of the cod liver oil to vitamins A and D.

Weld[48] has reported the favorable use of vitamin D in moderate doses or of irradiation in decreasing capillary permeability when it is abnormal. McNealy, Shapiro, and Melnick[49] have had beneficial results with the use of large doses of vitamin D in checking the bleeding tendency in obstructive jaundice.

The administration of huge doses of this vitamin will result in a hypervitaminosis which is manifested by an increase in the rate of calcification. When the calcium phosphorus balance is negative metastatic calcification takes place which involves the blood vessels, kidneys, heart, stomach, and bronchi, bringing about irritation and eventual degeneration of these tissues.

Vitamin D is the only vitamin which is not adequately supplied in a well balanced diet. It is formed in the skin when exposed to direct sunlight. Egg yolk, butter and liver are additional sources. The daily minimal requirement for adults consists of 625 International units.

VITAMIN P

In 1936 another vitamin was added to the list, vitamin P. This substance was stated to occur in lemon juice and red peppers. When cevitamic acid failed, concentrates of vitamin P were reported to decrease capillary permeability in certain pathologic conditions where this manifestation occurred. The existence of vitamin P has been questioned by several investigators. Ivy and Gray[50] have this to say concerning the citrin factor: "The status of vitamin P is by no means clear. Animal experiments have yielded no support for the existence of the vitamin. Clinical experience with the substance is not yet extensive enough to definitely establish its therapeutic or pharmacological activity. That citrin is a vitamin required by man has not been proved."

VITAMIN K

Just a few years have passed since Dam[51] discovered vitamin K in his investigative work on deficient diets in chicks, but an enormous amount of experimental and clinical research has made this product of utmost importance in the treatment of hemorrhagic diathesis associated with hypoprothrombinemia. Quick, in 1935,[52] introduced a test which provided a means of estimating plasma prothrombin and he theorized that a deficiency of vitamin K was responsible for the hemorrhagic tendencies in jaundiced patients. Warner, Brinkhous, and Smith,[53] however, were the first to report on the therapeutic value of this vitamin in humans. The mechanism of action in preventing hemorrhage was by the elevation of a low prothrombin level as was shown by Butt, Snell and Osterberg[54] with the use of vitamin K in patients with obstructive jaundice.

Vitamin K in its natural state occurs in green leaves and vegetables, principally in alfalfa, dried chestnut, cabbage, spinach, fat of hog liver, and in some fish.[55,56] Osterberg[57] has shown that large amounts of vitamin K resulted from the bacterial putrefaction of fish meal. The vitamin is a fat soluble, thermostable substance which is labile to ultra-violet light and alkali.[58] Chemical synthesis by different groups of investigators[59] has proved it to be a 2-methyl-3 phytyl-1,4-naphthoquinone. Almquist and Klose[60] studied the synthetic naphthoquinone groups and found that phthiocol possessed the same antihemorrhagic activity as the natural vitamin K. Butt et al.[61] used this preparation in the treatment of hypoprothrombinemia in humans with obstructive jaundice and found the results to be the same as those obtained in the use of alfalfa concentrate.

Inasmuch as prothrombin has not been isolated it is not possible to determine if vitamin K constitutes its basic structure or if it acts as a catalyst in the formation of prothrombin. The liver is the site of prothrombin formation as various experiments have proved. Warner[62] showed that partial hepatectomy in rats resulted in a lowered prothrombin level which increased toward normal along with liver regeneration. Andrus, Lord, and Moore[63] found that one hour after complete hepatectomy there is

a drop of 45 per cent in the plasma prothrombin level and that after ten hours the level was 20 per cent of normal or lower. Postmortem examinations of the dogs revealed ecchymoses and petechiae. Liver poisons seriously affect prothrombin production. Therefore, the normal prothrombin level is dependent chiefly on the physiologic integrity of the liver. In the presence of disease of the liver, this level will vary in accordance with the severity of liver damage.

For the synthesis of prothrombin, vitamin K is essential. In patients with obstructive jaundice who have a lowered plasma prothrombin and whose diets are adequate in vitamin K, the prothrombin level will remain low until bile salts are added to the diets. Vitamin K, being a fat soluble vitamin, requires the presence of bile salts to permit absorption in the intestine. Therefore, four factors must be present to insure normal production of prothrombin: (1) Sufficient vitamin K intake; (2) the presence of normal bile salts in the intestines; (3) an adequate intestinal absorptive surface, and (4) a physiologic normal liver.

Wherever a state of hypoprothrombinemia exists the indication for vitamin K administration is present. Furthermore, whenever prothrombin deficiency is expected to result vitamin K has a therapeutic indication. Foremost of the disease entities in which vitamin K is to be used is the treatment of obstructive jaundice. Patients with this condition must be put into this classification with regards to therapeutic management: (1) Those patients with normal prothrombin time; (2) those with decreased prothrombin time; (3) those with low prothrombin time who are actively bleeding. Therapy in the first group is prophylactic while that for groups 2 and 3 is urgent. Butt et al.[64] have reported the results obtained in the use of vitamin K preoperatively in a series of 73 patients with obstructive jaundice. Two patients had bleeding preoperatively and 13 postoperatively. When no vitamin K or bile salts were given to 14 patients with this same condition, nine had bleeding postoperatively but this was controlled in seven patients by beginning this therapy. In 28 patients receiving vitamin K and bile salts pre- and postoperatively, only three had bleeding following surgery. Townsend and Mills[65] found that no bleeding occurred postoperatively in ten cases of jaundice associated with prothrombin deficiency which were treated with vitamin K bile salts. These authors state that after operation there may be further disturbance in plasma prothrombin with an abnormal tendency to bleed. Even though the prothrombin time has been normal preoperatively it may increase in six to eight hours and, with a reduction of 50 per cent or more of normal, free bleeding will occur. Hemorrhage is more apt to occur in the postoperative period especially within one to four days but may be delayed until the tenth day. One case has been reported in which bleeding occurred on the eighteenth postoperative day. Reductions of 30 per cent in the prothrombin level often occur immediately after operation. Because of this rapid change postoperatively, determinations of prothrombin time should be done frequently and at least daily during the convalescent period. The reasons for this decline in prothrombin level after the relief of biliary obstruction lie in one if not all of the following factors: Lack of vitamin K intake; temporary ileus; an anoxemia of the liver due to anesthetic agents; blood loss during the operation; and finally the absence of bile salts from the bile for several postoperative days, depending upon the duration of the biliary obstruction.[66] Stewart[67] reports the instance in which two patients with obstructive jaundice refused vitamin K therapy postoperatively and a steady drop in plasma prothrombin with subsequent hemorrhage occurred. On resuming vitamin K therapy bleeding ceased as the prothrombin time decreased. When the response to vitamin K therapy is not present both pre- and postoperatively, a markedly impaired liver is probably the cause.

Prothrombin deficiencies will usually be more marked in obstructive jaundice due to neoplasm of the pancreas, ampulla of Vater,

or gallbladder than in that due to postoperative stricture of the common duct or to the presence of an obstructing stoma. Deficiency of prothrombin will also occur in the presence of complete biliary fistula; although this condition is rare and must be present a considerable length of time before the prothrombin time is disturbed. The prothrombin reserve in the body is large and this factor of safety is extremely beneficial in events such as massive uncomplicated hemorrhage and temporary vitamin deficiency diets. In this latter instance it is interesting to observe that there is evidence[68] indicating that synthesis of vitamin K occurs to some degree in the intestine due to bacillary metabolism, principally *B. coli*, *B. cereus*, and *B. subtilis*. Other clinical entities which are frequently accompanied by prothrombin deficiency are portal and biliary cirrhosis, tumefaction of the liver; acute hepatitis, chloroform and phosphorus poisoning resulting in hepatocellular damage, rarely in the presence of extra-hepatic infections such as pneumonia, carcinoma of the stomach and intestines, pyloric stenosis, and in hemorrhagic diseases of the newborn. Butt, Snell, and Osterberg[69] have shown results of lowered prothrombin levels in sprue, ulcerative colitis and celiac disease.

In vitamin K therapy the dose of the vitamin varies in different individuals and must be adjusted to the response as indicated by frequent determinations of the prothrombin time. In some instances the ordinary therapeutic dose may have to be increased many times in order to bring about satisfactory results. Rhoads[70] has used several of the vitamin products and has recommended the following dosage of the various synthetics in routine procedure: cerophyl 2.5 gm. t.i.d., klotogen 0.6 gm. t.i.d., 2-methyl-1, 4 naphthoquinone 0.002 gm. t.i.d., bile salts are to be administered along with the vitamin; bilron 0.6 gm. t.i.d., desicol 1.0 gm. t.i.d., bilein 0.6 gm. t.i.d., sodium deoxycholate 0.2 gm. t.i.d., sodium glycocholate and taurocholate 1-2 gm. daily.

The oral administration of vitamin K has been found to be the most efficacious. Occasionally, however, complications such as hematemesis, nausea and vomiting will prevent administration of the vitamin either by mouth or gastric tube thereby necessitating parenteral or intravenous injection of the vitamin. Smith et al.[71] have used phthiocol intravenously with success. Transfusion of whole fresh blood should be resorted to if the prothrombin content of the blood is below 15 per cent of normal (Quick). The elevation of prothrombin level will only be temporary and vitamin therapy must be continued. Rhoads and Panzier[72] state that prothrombin content rapidly decreases in preserved blood and that blood from "blood banks" is practically worthless in this respect. In cases in which marked liver damage is present, the most efficacious means of restoring prothrombin is by blood tranfusion.

SUMMARY

Deficiencies of vitamin A frequently will be found in tuberculosis and in hyperthyroidism and certainly in those conditions wherein the intake or utilization of the vitamin is interfered with as for example in obstructive biliary disease. Experimental work has indicated that certain anti-infective properties are possessed by this vitamin but this has not been thoroughly substantiated.

All of the individual components of the vitamin B complex are not as well understood as is vitamin B_1. However, a deficiency of one factor is usually accompanied by a lack of another. Avitaminosis B is not a surgical entity but when it accompanies a disease which is surgical the picture may be complex. In the presence of increased metabolic rate the need for vitamin B_1 is also increased. An abnormal cardiac state in hyperthyroidism can be exaggerated by a deficiency of vitamin B. Vitamin B_1 has been found to stimulate the appetite. Inasmuch as no practical clinical test exists for determining the vitamin B reserve, it is essential that the daily intake of this vitamin exceed the daily minimal requirement.

The role that vitamin C plays in the healing of wounds is of such import that actual or potential deficiencies must be corrected. Practical laboratory tests can easily be used

to determine the presence of subclinical deficiencies.

In the healing of fractures vitamin D is probably of some significance. It is in the treatment of parathyroid tetany that this vitamin has practical application. Vitamin oils rich in vitamin D have been used locally in the treatment of wounds and burns with good results due to the stimulating effect on epithelialization.

Of all the vitamins, K has the most important use in surgery. Bleeding, heretofore, has been feared both before and after operations upon patients with obstructive biliary disease but this complication is unusual now that a better understanding of the etiology of this condition has been discovered and proper therapy instituted. However, it is not only in this entity that this factor is deficient for in any disease which limits the intake or absorption of this vitamin and in any liver disease which has depleted the factor of safety of this organ an interference in prothrombin production will occur with the end result of a potential or actual hemorrhagic state. This can, in most instances, be corrected by the administration of vitamin K.

With regard to all of the vitamins, one can expect to find a general avitaminosis, clinical or subclinical, in any condition manifesting deficiency of any single factor. Certainly in patients with prolonged debilitating diseases or in patients with diseases of the gastrointestinal tract this will be common. The surgical patient should have a complete study to ascertain whether or not a state of avitaminosis exists and deficiencies should be corrected before an operative procedure is undertaken.

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MEDICAL MANAGEMENT OF CARDIOSPASM*

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NEW ORLEANS

Since Thomas Willis' 1679 description of the syndrome we prefer to call cardiospasm, an ever changing terminology has been offered by authors presenting their concept of this symptom complex. Common usage, a normal cardiac orifice free of organic obstruction yet producing all the clinical manifestations of an obstructive lesion, rationalize our adherence to the term cardiospasm.

Difference in opinion on etiology has been responsible for the following appelations: Achalasia, phrenospasm, hiatal esophagismus, mega-esophagus, preventriculosis, esophagectasis, paralytic dilatation, idiopathic esophageal dilatation. Little can be claimed for the adoption of any of these titles for as yet the etiologic background of this entity remains problematic.

ETIOLOGY

A resumé of possible causative factors resolves itself into three groups: (1) Intra-esophageal changes including fibrosis, kinking, anomalous length and paralysis. (2) Extra-esophageal influence by fibrosis, spasm or anomaly of the diaphragmatic crura, periesophageal fibrosis of the crural canal, an unusual "liver tunnel", pressure of lung tips and hypertrophied oblique muscle of the stomach. (3.) Neurogenic dysfunction including vagal lesions, sympathetic disturbance, mesenteric plexus degeneration due to various causes, and purely functional states.

Those explanations of the first two divisions have been discarded because of incompatability with well conducted pathologic observations. The third division has many debatable angles with conflicting experimental studies and unsatisfactory clinical observations. No theory has been proved and the cause of cardiospasm remains unknown.

Pathologic studies have been of most value in disproving all etiologic theories other than the neurogenic. Mesenteric plexus degenerative changes and vagal lesions are frequently encountered. Other changes such as the varying degrees of esophagitis, fibrosis, dilatation, kinking, hypertrophy, diverticula and even mesenteric plexus degeneration are more probably the effect rather than the cause of the entity. Uniformly, hypertrophy and dilation end approximately an inch above the cardiac end of the esophagus.

SYMPTOMATOLOGY

Dysphagia is the cardinal manifestation of cardiospasm with other symptomatology related to the degree of esophageal decompensation. The entity is usually well established before the clinical picture develops, difficulty in swallowing may at first be intermittent and occur only under such precipitating influences as emotional upsets, cold liquids and irritants; subsequently it becomes persistent and progressive.

*Read before the Orleans Parish Medical Society, October 14, 1940.

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When definite dysphagia becomes obvious, a pathologic esophagus can be demonstrated. If adequate therapeutic measures are not promptly exacted the syndrome develops. In the early stages, food seems to stick in the esophagus, dislodgement is difficult, the patient learns that copious liquids act as a natural hydrostatic dilator. Choking while eating in frequent; however, by force the patient can always manage to get the food through into the stomach. Various and variable degrees of retrosternal and retroxiphoid pain with radiations into the shoulders, neck and ramus of the mandible are encountered. These are the manifestations as long as the esophagus is only slightly dilated and compensates the increased intra-esophageal pressure by muscle and elastic hypertrophy.

Fig. 1. Case illustrating moderately advanced cardiospasm; the esophagus at this stage is still compensated.

In decompensated cardiospasm the esophagus has dilated to become elongated and there is a resultant kinking and muscular thinning. With this advanced pathology there is esophageal retention of food producing postprandial substernal fullness with a sensation of weight in the chest and actual quantitative dyspepsia. Spontaneous and induced regurgitation of alkaline material is common with reflux into the buccal cavity at night a typical occurrence. With the development of esophagitis substernal burning becomes marked. As the disease progresses symptoms advance in severity and rapid weight loss occurs; respiratory symptoms of dyspnea and aspiration bronchopneumonic disease are reported.

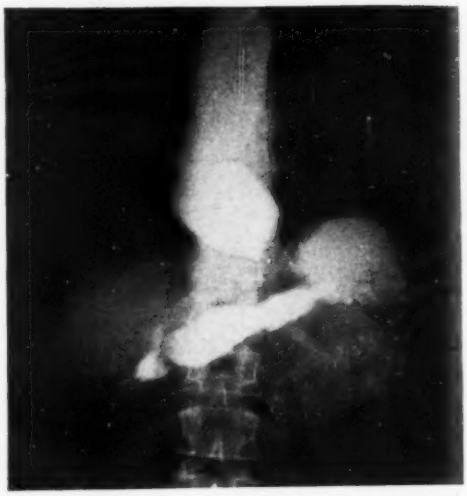

Fig. 2. Illustrating a decompensated esophagus occurring from inadequate therapy to the case shown in figure 1.

A characteristic clinical picture indicates a confirmatory esophageal roentgenogram. A blunt or smooth tapering occlusion at or near the cardia with secondary dilatation and angulation of the esophagus above it is typical. The lower end is cone shaped with the tip to the left below the dome of the diaphragm. A few enthusiastic endoscopists insist esophagoscopy is essential to a conclusive diagnosis. We feel that only occasionally is there a call for such study and we are reticent to expose patients to unnecessary scoping. In instances in which there is reasonable doubt esophagoscopy has value in excluding other diseases, particularly malignancy.

The physical signs of cardiospasm are not of significant importance.

Cardiospasm may be associated with or the cause of chronic pulmonary disease. The coincidental occurrence seems too frequent to be merely an association and the reports of bronchitis and bronchial asthma, or aspiration pneumonitis, lung abscess, and pulmonary fibrosis seem to favor cardiospasm being causative by producing reflux into the bronchial tree. Diverticulum of the

Fig. 3. Roentgenogram showing a pulsion diverticulum occurring as a complication of cardiospasm. This patient also developed a severe bronchiectasis.

Fig. 4. Stricture of the esophagus manifested subsequent to deep x-ray therapy to the left breast.

esophagus has also been reported as an associant and here again cardiospasm by causing weakness of the esophageal musculature may produce the herniation. Carcinoma of the stomach or esophagus without cardiospasm is frequent and seldom seems to be the result of the chronic irritation excited by cardiospasm. Esophageal ulceration may be primary and result in scarring to cause an impure cardiospasm or it may result from the esophagitis and circulatory disturbance resulting from a true spasm.

DIFFERENTIAL DIAGNOSIS

In differential diagnosis, however, there are ten entities which, due to their obstructive esophageal nature or to their simulation in symptomatology, must be considered.

Fibrotic benign stricture in 80 per cent of cases has a history of ingestion of caustics, healed ulceration or esophagitis. Congenital etiology exists, however, and the history may be indefinite. Deep x-ray therapy to the thoracic cage may produce a stricture. X-ray is the best aid in revealing the nature of the stricture which is usually higher than the cardia.

With carcinoma there is usually a short rapidly progressive history. On x-ray there is irregularity of the shadow as it tails out —carcinoma rarely produces its obstruction at exactly the hiatus, but usually extends above. The marked proximal dilatation encountered in cardiospasm is not a part of

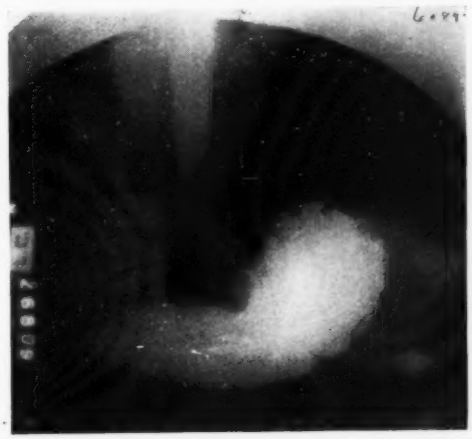

Fig. 5. The typical radiographic finding in carcinoma. The patient has a six weeks' history of dysphagia.

the picture of carcinoma. Bougienage produces bleeding. Esophagoscopy and biopsy are essential to a conclusive diagnosis.

The Plummer-Vinson syndrome of hypochromic anemia, atrophic glossitis and achlorhydria is characteristic. A negative x-ray picture proves the differentiation.

Hysteria tends to disappear instead of progress. The dysphagia is complained of at a level high in the esophagus. The characteristic roentgenologic picture is not present.

Para-esophageal hernia usually radiates pain under the left breast which is increased on recumbency; the x-ray is typical.

Mediastinal tumors give other manifestations; the obstruction is not at the diaphragmatic level and x-ray study readily reveals their extra-esophageal character.

Muscular hypertrophy of the cardiac sphincter (comparable to congenital hypertrophic pyloric stenosis) is a rare lesion and has only been diagnosed surgically or pathologically. It may be suspected from a cone-shaped smooth, symmetrical obstruction without dilatation.

Angina pectoris: Edeiken has emphasized the simulation to angina. The differentiation is achieved by proper cardiovascular evaluation, remembering angina might complicate cardiospasm.

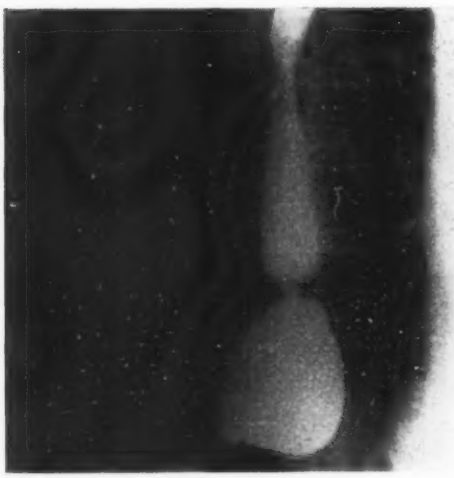

Fig. 6. An unusual radiographic study showing diffuse lower esophageal spasm associated with cardiospasm.

Diffuse spasm of the lower half of the esophagus occurs rather characteristically in relation to the temperamental status of the patient as contrasted to the generally accepted lack of this element in the cardiospastic. Roentgenoscopy definitely differentiates it from cardiospasm in revealing diffuse irregular spasm, multiple spastic segments and diffuse narrowing of the distal half of the esophagus.

Peptic ulcer of the esophagus has a clinical picture simulating an ulceration elsewhere with the predominance of symptomatology substernal and the association of extremely painful dysphagia. X-ray study may reveal cardiospasm when the esophageal lesion is at the cardia but the other changes are not present.

Diverticula of the esophagus may arise as a complication of cardiospasm. If it is primary there usually is mild dysphagia without the clinical or roentgenologic picture of esophageal decompensation.

Biliary disease may cause similar pain reference and the substernal symptomatology of cardiospasm. Differentiation is realized by an adequate evaluation and x-ray study.

TREATMENT

General measures to improve the mental and physical well being of the patient are essential but not specific measures. Therapeutically we deny the statement that drugs are of no use. We must admit gradations of severity. There are mild cases which, after single bougienage, may be controlled by an occasional antispasmodic. Conversely severe instances may likewise gain temporary and emergency relief during periods between dilatations. We have found nitroglycerine the most effective medication for emergency relief and for pre-dilatation relaxation in difficult cases. Aminophyllin gives excellent results without the unpleasant reactions of the nitrates. Atropine, papaverine hydrocloride, amyl nitrate and stramonium have relaxing qualifications in selected instances but in our experience are only effective in mild cases and in association with dilatation in the severe

cases. Morphine relaxes the distal esophagus well but for obvious reasons is avoided.

Thiamin chloride may be used to supplement other measures. Regardless of the validity of Etzel's contention, a vitamin B deficiency, whether primary or secondary being unproved, is frequently apparent.

Hyperpyrexia, local diathermy and spinal anesthesia have been advocated but deserve only mention.

Bougienage of one variety or another has been practiced for more than fifty years in relieving dysphagia due to cardiospasm.

In a review of dilators, mention must be given to semi-stiff fiber bougies and mechanical divulsors inserted through the esophagoscope. Their use necessarily involves a semioperative procedure, they are more applicable in cases in which scarring or fibrous stricturing exists. Sippy's graduated olives, and those of others, in various sizes and shapes attached to a fiber and guided by a swallowed thread, are introduced fearlessly by persistent adherents. They are probably safest in expert hands. We have seen under the fluoroscope an apparently taut cord loosen, the bougie fail to engage the cardia and pass blindly into a dilated esophageal pouch. Because of this as well as of other obvious limitations, they must be reserved for the expert endoscopist.

Hurst introduced his mercury filled bougies in 1913. They are rubber tubes varying in diameter (from 21 to 40 English), 31 inches long and each containing the same quantity of mercury (21 ounces). These are carried and guided through the esophagus by their weight, opening a passageway by their size.

These dilators, in our experience, are the easiest passed; they cause less discomfort and are unquestionably the safest instruments available in properly indicated cases. Successively larger tubes are passed at a single sitting, and in most cases the largest one meets with only slightly more resistance than the smallest.

Additional factors in the use of these bougies include the following: (1) In the instance of narrowing at sites, in addition to that at the cardia, all are dilated to the same extent by the one passage. (2) Patients have been taught to use the bougies in selected instances. (3) No fatality has been recorded from the use of this procedure. (4) It is obvious that these bougies have limitations and are best employed when the cardiac opening remains dependent and the existing pathologic condition has not brought about a great sacculation at a level below the hiatus, although we have employed them quite successfully in severe cases. (5) The large size, #40, often proves annoying to patients because of the bulk in the pharynx.

The history of the bag divulsion dates back to J. C. Russel's work of 1898. In 1906 at The Mayo Clinic, Plummer modified Russel's instrument and introduced into prominence the rubber covered silk balloon using hydrostatic pressure. Moersch and Vinson, with their excellent work and statistic accumulation, have sustained their preceptor's teachings.

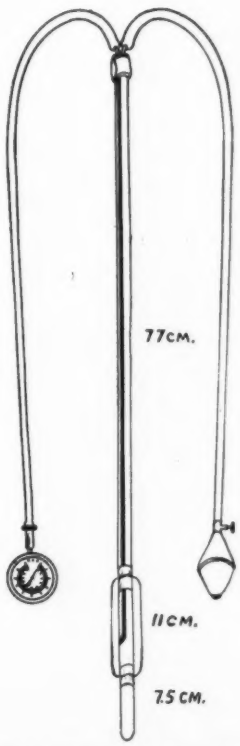

Fig. 7. Sketch of mercury pneumatic dilator.

The instrument is a rubber tube supported by a whalebone staff tipped with an olive just behind which is a rubber covered silk balloon which is dilated by hydrostatic pressure regulated by special adapters. All dilations are carried out over a previously swallowed silk thread (five yards) held taut, which is thought to eliminate all danger of perforation. It requires a source of running water and is not portable and for this reason is not as practical as could be wished. Failure to place the dilator, unsatisfactory results due to improper technic, considerable pain and a mortality percentage are admitted; however, it has a definite advantage in that divulsion is achieved by its use.

In 1929 Frank Smithies designed the pneumatic dilator modification of Plummer's apparatus in an effort to remedy proved limitation of the latter divulsor. Smithies' dilator, being portable, requiring no special water supply, being devoid of whalebone staff but having a metal shaft with safety control, and being of inexpensive construction, was a notable achievement. It rendered fluoroscopic control of divulsion dilation practical. Its only essential distinction from the Plummer dilator, however, is that it is pneumatic.

Since September 1938, we have used a mercury pneumatic dilator. This new dilator and divulsor combines the principles of Hurst, Plummer, and Smithies and achieves a position of maximal efficiency and safety.

It is a #21 Hurst mercury tube; on the distal end, 7.5 cm. from the tip, has been incorporated a rubber covered silk bag 11 cm. in length to which a small catheter runs through the mercury filled tube. By this means distention, under the control of a sphygmomanometer, may be effected.

The distinct advantages of this instrument are that: (1) A swallowed guiding thread is not required; it is easily passed, being the size of the small Hurst dilator. It is carried through by virtue of its contained 21 ounces of mercury, which is sufficient to force the closed sphincter and which is in itself a guide but which is not sufficiently forceful to traumatize or perforate the esophagus. (2) This type dilator is most easily passed with less discomfort than any other type and does not show any tendency to coil in a dilated prediaphragmatic dilatation, as might be suggested by some. (3) Only a single instrumentation is required, as contrasted to the passing of an olive prior to the use of a Plummer dilator and the use of graduated Hurst bougies. (4) It offers controlled pneumatic divulsion, which is more practical and safer than hydrostatic dilation, and this in combination with the bougie qualifications of the Hurst dilator. (5) It is applicable to x-ray examination.

Dilatation and divulsion rarely fail and the prognosis is such that one seldom considers operative procedures. Gastrotomy as such is merely palliative. Retrograde dilation with Tucker's instrument and divulsion manually or by forceps from the gastric side are major procedures reserved for those few instances in which adequate indications exist. Heller, Windel, Heyrowsky, Watts, Womack and others have each introduced an operative procedure of note adapting pyloric surgery to the cardia with various cardioplastics and anastomoses.

Knight has offered resection of the left coronary artery and the associated sympathetic fibers running to the cardiac esophagus. This procedure and other nerve section measures have not given a permanent result. The success of bilateral cervicothoracic sympathetic ganglionectomy is nullified by the production of a Horner syndrome.

SUMMARY

Cardiospasm is a condition which as yet defies establishment of etiology. Bougienage offers the most satisfactory method of management. Plastic and sympathetic surgery may be considered for severe cases that have not responded to a careful non-operative regimen.

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DISCUSSION

Dr. Allan Eustis (New Orleans): I wish to emphasize again one point brought out by Dr. Browne, especially in the last picture shown. It is very important before treating these cases medically for cardiospasm to be sure there is no malignancy. This was very forcibly impressed upon me a short while ago. A man giving definite symptoms of cardiospasm, on x-ray examination and esophagoscopy did not show any evidences of malignancy and was dilated for about six months by a competent laryngologist. He progressed very satisfactorily and the cardiospasm was much less intense when a second esophagoscopy was made after six months and also an x-ray, at which time definite carcinoma was demonstrated.

An attempt was made to remove the growth but it was already too extensive and only a gastrostomy was performed; the man died about four months later. Had this diagnosis been made when the symptoms of cardiospasm first presented themselves a resection of the lesion could have been performed most probably. We all know that the only chance for recovery from cancer is in early operation and I mention this case simply to prevent us from becoming too enthusiastic about the medical treatment of these patients.

Dr. M. E. DeBakey (New Orleans): Undoubtedly, the large majority of these patients can be treated conservatively but a certain number will require surgical intervention. Moersch found that of 805 patients treated conservatively, 71 per cent were completely relieved and Wachs observed that about 30 per cent required surgical therapy. Thus, it has been estimated that approximately a third of the patients will probably need more radical therapeutic procedures. Obviously, every person should be given the benefit of conservative treatment first but if such measures do not accomplish adequate relief of symptoms in a reasonable period of time, surgical intervention should be considered. Most physicians are reluctant to consider surgical therapy. This is probably due to the erroneous impression that the risk of operative therapy is considerably greater than that of conservative therapy. As a matter of fact, the difference in the mortalities is very slight. In Moersch's series of 804 cases the total mortality was 2.8 per cent and of 239 cases collected from the literature by Dr. Ochsner and me in which cardioplasty and esophago-gastrostomy were done, the mortality was 4.2 per cent.

A great variety of operative procedures have been devised and employed in the surgical treatment of this condition which clearly reflects the diversity of opinion and the conflict of views regarding its etiology and pathogenesis. Dr. Ochsner and I have recently reviewed the literature on this subject and have classified these procedures into: (1) those directed at the dilated esophagus; (2) those directed at the cardia; (3) those directed at the diaphragm, and (4) those directed at the nerve supply. In our opinion the most rational procedure is esophago-gastrostomy which consists of a side-to-side anastomosis between the esophagus and stomach in a manner similar to the Finney gastro-duodenostomy. This was originally performed by Heyrovsky, in 1912, and modified by Gröndahl, in 1916. We have performed this procedure in two patients with complete relief of symptoms. In another patient, sympathectomy was employed but symptoms recurred within two weeks after operation.

Of 370 cases of achalasia collected from the literature in which surgical therapy was institutetd, 21 (5.6 per cent) were treated by phrenotomy; 30 (8.1 per cent) by vagotomy and sympathectomy; 80 (21.6 per cent) by transgastric dilatation; 99 (26.8 per cent) by esophago-gastrostomy; and 140 (37.8 per cent) by cardiomyotomy and cardioplasty. In this series of collected cases the best results were obtained by esophago-gastrostomy with an incidence of 93.9 per cent and the worst by vagotomy and sympathectomy with an incidence of 33.3 per cent. The incidences of good results obtained in the group treated by phrenotomy, transgastric dilatation, and cardioplasty were 57.1 per cent, 70.8 per cent, and 81.4 per cent respectively. The highest incidence of failures 36.6 per cent occurred in the group treated by vagotomy and sympathectomy and the lowest incidence, 1 per cent, in the group treated by esophago-gastrostomy. Failures among other operative procedures ranged from 10 per cent to 28 per cent. The

highest operative mortality, 16.6 per cent, occurred in the group treated by vagotomy and sympathectomy and the lowest 3.5 per cent among those treated by cardioplasty. The operative mortality in the esophago-gastrostomy group was 5 per cent. These results confirm our opinion that the most rational procedure is esophago-gastrostomy because it gives the best results with the least incidence of failures and a very low mortality.

Dr. Mims Gage (New Orleans): I feel that cardiospasm is a disease. There is the same thing in the duodenum, in common duct, bile duct, in the colon and also in the urethras with more or less similar onset and symptoms. We all have these patients. Most physicians treated them by dilatation and a large per cent recover. The majority of cases occur in neurotic women and neurotic men. A neurotic man is worse than a neurotic woman but the incidence is less. There are a number of persons who will not be relieved by dilatation. With early diagnosis the majority of them are benefited by conservative treatment first. Only a small per cent need operation, and those really need it. Continued dilatation will not give relief in the common bile duct.

This is a disease about which we know little of the etiology. Many procedures have been tried but, as stated, all of these patients need conservative treatment in the beginning. A large number have been injected at The Mayo Clinic and have been relieved. Some were probably women where probably if given a hypodermic it would have done just as much good.

TESTOSTERONE PROPIONATE* IN IMPOTENCE:

A REPORT OF EIGHT CASES

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AND
T. E. McMILLAN, M. D.
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Dorland[1] defines impotence as "Lack of power: chiefly of copulative power or virility. It may be atonic, due to loss of impulse; psychic, dependent on mental complex; or symptomatic, resulting from some other disorder." It is in these latter two broad categories that most of the difficulty in adequately determining and treating the cause of a given case of impotence is encountered. In one case the problem may be a very simple one; in another, it may be impossible of solution. For example, there is no mystery about the impotence of the eunuch or castrate. Here there is definite testicular deficiency. The administration of testosterone to these patients will frequently render them potent, as has been shown by many investigators, among whom are Vest and Howard,[2] Foss,[3] Kenyon et al.[4] and Miller.[5] On the other hand, the impotence of the sexually mature male, apparently normal physically, may defy the combined skill of internist, urologist and psychiatrist.

Theoretically the use of testosterone in cases of impotence should be reserved for those cases in which definite testicular deficiency can be demonstrated or for those cases of probable psychic origin in which it is hoped that the testosterone being given will cause sexual stimulation and thus overcome whatever psychic factor may be causally operative. However, in our experience it has been very difficult to segregate cases of impotence which have their etiology solely in deficient testicular function. This is so because as yet there is no simple and satisfactory method of quantitatively estimating male sex hormone in the body or in urinary excretion. We are still forced to rely upon an examination of the secondary sex characteristics to determine whether or not we are dealing with testicular hypofunction. Here again, although marked deviation from the normal in size of penis, prostate, distribution of body hair, and pitch of voice, often point to testicular deficiency, only slight deviations may be utterly insignificant clinically.

In individuals beyond middle age, even these diagnostic criteria are not unusually applicable but in these patients one would expect a deficient testicular function physiologically. Careful examination of the histories of cases presented in this article will show how complex the problem of impotence may be. We have selected eight patients whom we thought might respond to testosterone therapy, even though it is admitted that none of the eight was an absolute candidate for this treatment. Yet, since most of our patients were elderly, our de-

*The testosterone propionate used in our cases was neo-hombreol generously provided by the makers, Roche-Organon, Inc., Nutley, N. J.

cision to give them testosterone was bolstered by the work of Laroche and Bompard[6] who found that testosterone often favorably influenced the impotence of physiologic involution. Much the same findings are reported by Schmitz[7] who treated 45 cases of involutional hypogonadism with testosterone propionate. Symptoms including depression, nervousness, premature aging, and impotence have been noticed with beginning prostatic hypertrophy. In 36 cases, definite and dramatic improvement followed muscular or subcutaneous injections of 5 mg., one to three times weekly. No side reactions were observed.

Deficiency in testicular secretion of varying degree was suspected in all of our cases, yet it will be seen that many other factors thought to be etiologically concerned in impotence are operative. For example, local genito-urinary pathology of a mild degree was present in all patients and an attempt was made to eliminate this through appropriate local treatment. Some of the cases were complicated by environmental factors thought to be conducive to impotence. In so far as was possible these were corrected. Similarly, the psychic background of the patient was gone into and an appeal to reason made where indicated. Our patients presented a number of factors which may seriously interfere with even a normal physiologic state of potency. For example, too frequent intercourse, abnormal sex practices, the taking of narcotic or hypnotic drugs, temporary below par constitutions are suspicious etiologic considerations present in one case or another.

Following are the case histories in our series:

CASE NO. 1

A 57 year old male complaining of prostate trouble for 10 years, manifested by occasional slight burning of urination, slow stream and rather marked impotence. His only treatment has been irregular prostatic massage which always relieved the urinary burning. His examination revealed him to be in very good condition. The only positive finding was a benign prostatic hypertrophy (grade 2) with 1¾ ounce residual urine. Treatment was first instituted on June 6, 1940, and he was then seen at approximately weekly intervals for seven weeks. During this time he had prostatic massages, silver nitrate instillations, endoscopic therapy, dilatation of posterior urethra, and thyroid and strychnine internally. No improvement was noted. Then on September 11, testosterone propionate therapy was instituted, together with the same local therapy. He received 25 mg. testosterone at weekly intervals for thirteen weeks. A slight, but definite improvement was noted in his sexual ability following the institution of testosterone therapy. His erections were better and intercourse once a week fairly satisfactory. There has been no decrease in the benign prostatic hypertrophy. The exact etiology of this impotence was not determined. The hypertrophy may be a factor, or the fact that his wife is twenty years younger than he may be a cause.

CASE NO. 2

A 56 year old male complaining of impotency for one year. Prior to 1935 he had very satisfactory intercourse three times a week. Then due to illness of wife he abstained except about once every six to eight weeks for the next two years. He then attempted to resume his previous schedule, but found that he was able to have intercourse about every two weeks. More frequent attempts resulted in poor erections and premature ejaculation. His past history was essentially negative. Examination revealed an intellectual, well balanced male in excellent physical condition. He was given prostatic massages at weekly intervals, with no benefit. Then testosterone therapy was started and he received 15 injections of 25 mg. each at five to seven day intervals. During this time he also received prostatic massages, urethral dilatations and instillations of weak silver nitrate into the posterior urethra. He also received thyroid internally. At no time did he note any improvement in his sexual ability nor was there any change in his physical examination. A period of rest and participation in outdoor exercise was advised, but still there was no improvement in intercourse. Again testosterone therapy, together with endoscopies, urethral dilatations and prostatic massages were instituted. He received 10 injections of 25 mg. each, supplemented with local treatment during the next six weeks. Still no improvement was noted. No etiologic factor can be ascertained except that his complaint began after a period of abstinence. We thought this man should respond to testosterone therapy.

CASE NO. 3

A 48 year old male complaining of impotency for the past seven years. He managed to have intercourse every few months but quite unsatisfactorily. His erections were always very poor. His history revealed that he had suffered with asthma for several years and took barbiturates frequently. Also that his complaint started after many financial difficulties. He maintained, however, that his difficulties had no effect on his

sexual ability. His general physical examination was negative, except for a very mild prostatitis. Testosterone therapy was started and he received 25 mg. at five to seven day intervals, until 22 injections had been given. During this time he also had prostatic massages, urethral dilatations and instillations of weak silver nitrate which soon eliminated all local morbid anatomy. Definite improvement was noted after the fifth injection and he continued to improve until he was able to indulge in very satisfactory intercourse once a week. During the asthmatic attacks the use of barbiturates of course caused recurrence of his impotency. He continued to do fairly well two months after starting treatment. This patient seems definitely benefited by testosterone.

CASE NO. 4

A 22 year old colored male complaining of complete impotency. History reveals no erection for three months, and prior to this time he had coitus every day for the past five years. His past health was excellent; he has had no venereal infection. His examination revealed a well developed almost perfect physical specimen. Extensive diagnostic procedures in the clinic were carried out because of many complaints he subsequently offered, all of which were on a neurotic basis. The only positive finding was by the neurologist, who diagnosed a neurosis on the basis of his impotency. The only apparent cause for his impotence was fatigue. Curiously he showed practically no posterior urethritis or prostatitis. Therapy to the posterior urethra, prostatic massages and urethral dilatations with complete rest from intercourse were carried out for four months, but no improvement noted, and his many aches and pains and low morale continued. He was then given testosterone 25 mg. every five days, plus weekly local treatment until he had had 25 injections. After the eleventh injection he began to awake with a fair erection and improvement continued until he was able to have normal intercourse again, although he was still restrained as to the number of times he might try coitus each week. With revival of his erections the many other symptoms disappeared and he felt perfectly well.

CASE NO. 5

A 50 year old male complaining of poor erections for three years, and especially during the past year, with no sexual desire during this time. Past history revealed a low blood pressure of several years' duration, gastric hyperacidity and bleeding hemorrhoids. Morning erections failed if he tried coitus. Had gonorrhea four times and a hard chancre twelve years ago, all of which were eradicated by treatment. Subsequent blood and spinal tests have revealed no indication of trouble. He is now married for the second time, his wife being 26 years of age. He smokes 40 cigarettes daily and gets very little exercise. Physical examination revealed suspicious focal infections in mouth, small external and internal hemorrhoids and a mild prostatitis. Cystoscopy revealed a slight obstruction due to mild prostatic hypertrophy. All foci of infection were first eliminated and thyroid and strychnine prescribed. Injections of 25 mg. testosterone were given at weekly intervals for ten weeks, together with endoscopies, urethral dilatations, prostatic massages and weak silver nitrate instillations. Definite improvement was noted after ten weeks, but at the best he could have coitus only once every seven to ten days. Undoubtedly the psychic factor and local pathology were both operative in the etiology of this impotence.

CASE NO. 6

A 64 year old male complaining of almost complete impotence for two years. Past history revealed an anginal attack three years ago, an uncomplicated gonorrhea 30 years ago. He is happily married and comparatively free of worries. The only positive finding on examination was a definite chronic prostatitis. It was decided again to combine local therapy with testosterone, and 25 mg. injections were given at five to seven day intervals, together with prostatic massages, occasional urethral dilatations and weak silver nitrate instillations. He also had thyroid internally. After 12 injections he showed definite improvement of his impotency and coitus was fairly satisfactory. He continued to show 3 to 4 plus pus in the expressed prostatic secretion in spite of the local therapy. The value of testosterone in this case was ascertained only by comparison with similar cases treated by local therapy alone. We feel that he was benefited by the injections.

CASE NO. 7

A 48 year old male complaining of marked impotence for one and a half years, of fairly sudden onset, and complete failure of erection for the past two months. He feels excellent generally and has enjoyed good health. He had uncomplicated gonorrhea 30 years ago. History revealed some marital strife existing due to his extramarital activities and he works very hard ten to twelve hours daily and participates in very little outdoor recreation. His physical examination was essentially negative except for a very mild posterior urethritis. The etiology of this impotence was environmental and influenced by overwork. Since testosterone seemed to be out of place in such a case, only local therapy was used for four weeks, with no improvement being noted. In fact he had even lost his urge for coitus. He was given injections of 25 mg. of testosterone every five days, together with the local therapy. He was persuaded to give up his girl friend and straighten out his domestic difficulties. After ten weeks his libido and erections were definitely improved and he is now having satisfactory coitus twice a week.

CASE NO. 8

A 40 year old male complaining of very poor erections, prematurity of ejaculation and flat sensation for three years, with loss of libido for two months. History revealed gonorrhea 15 years ago, complicated by prostatitis. Considerable scar formation was present in the bulbous and posterior urethra. The onset of his impotence was gradual and associated with marked loss of morale, even to the point of suicidal tendency. His examination was negative except for a definite prostato-vesiculitis, posterior urethritis and scar formation in the posterior and bulbous urethra. Treatment was directed at elimination of local pathology as this appeared to be the only cause of impotence. After eight weeks he improved enough to have fair coitus every eight to twelve days, but erections were still very poor, as was his morale. Local pathology eliminated as well as possible, we turned to supportive treatment with testosterone and he was given a series of twelve 25 mg. injections, one every five days, together with thyroid internally. Local treatment was also continued. Very definite improvement was noted after six weeks, at which time he was having satisfactory coitus once or twice a week, and his morale showed a great change for the better. After 12 injections he was given neo-hombreol dosules* to be used three times a week. He continues to do very well.

SUMMARY

These cases of impotence illustrate the difficulty that exists in segregating those cases which owe their etiology only to deficient secretion of testosterone. Psychic and environmental factors, together with local pathology, are present in some degree in nearly all cases. Although testosterone propionate therapy alone is not sufficient in all patients it should be used in all at least adjunctly. Removal of local pathology, stimulation of the posterior urethra with silver nitrate, heat and stimulation by sitz baths or Faradic current are other treatments and modalities which should be employed. Injections of 25 mg. of testosterone propionate at five day intervals seemed definitely beneficial in conjunction with local therapy and no ill effects were noted. In some instances the addition of small daily doses of thyroid seemed to help. We were strongly impressed by the fact that testosterone propionate greatly improves the low morale which is often exhibited by impotent men.

*Neo-hombreol dosules "Roche-Organon" (testosterone propionate ointment in individual dose containers for percutaneous use).

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SARCOMA OF THE UTERUS*

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AND
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NEW ORLEANS

The infrequency of sarcoma of the uterus as compared to carcinoma of this organ has caused the former to receive rather scant attention in the literature. It appears that Lebert[1] made the first diagnosis of sarcoma in 1845 by microscopic examination. However, it is since 1860, when C. Meyer[2] presented a case to the Berlin Obstetrical Society, that sarcoma of the uterus was recognized as a clinical and pathologic entity.

INCIDENCE

Despite its infrequency, sarcoma of the uterus is far from being a pathologic curiosity. Novak and Anderson[3] found during a period of twenty-five years, 59 cases of sarcoma out of 26,973 case specimens, an incidence of 4.5 per cent of uterine malignancies. Veit[4] noted 1,493 carcinomata to 40 sarcomata, a ratio of 1:37.2 in 42,395 gynecologic cases. At Mt. Sinai Hospital in New York City,[5] 236 carcinomata, as compared to 21 sarcomata, a ratio of 1:11.2,

*Read before the sixty-second annual meeting of the Louisiana State Medical Society, Shreveport, April 22, 1941.

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were found in a series from the gynecologic service. In Kimbrough's[6] series of 43 cases of sarcoma the incidence was found to be 3.2 per cent of uterine malignancies.

DIAGNOSIS

It is not often that the diagnosis of sarcoma is made preoperatively. There are no definite criteria for making such a clinical diagnosis. Symptoms such as bleeding or abnormal discharge may be present but do not distinguish it from carcinoma or perhaps fibroids. A rapid increase in size of myoma, especially when associated with bleeding, would be suggestive of a sarcomatous change in a previous benign leiomyoma. Later in the course of the disease, pain, anemia, cachexia and weakness may be noted. Occasionally curettage may aid but then the tumor must have grown into the endometrial cavity or must be of endometrial origin. This tumor is usually found in women during middle life, most frequently; according to Novak[7] in the fifth decade. Sarcoma botryoides, the grape-like sarcoma which is very rare is, however, most often found in infancy.

Although sarcoma may arise in any part of the uterus, the body is much more frequently the primary site as compared to the cervix. This greater frequency may be explained by the greater incidences of myomas in the corpus as compared to the cervix.

The disease will extend by direct growth, by lymphatics and by the blood stream. Since the hematogenous route is a rather important one, organs such as the lungs and liver are not infrequently involved. One also occasionally notes rather extensive metastases to the intestines, brain, omentum and peritoneum.

PATHOLOGY

Most sarcomas of the uterus are mural in origin. It may be primary or may arise from a pre-existing leiomyoma. The incidence of sarcomatous degeneration of myomas varies from 0.41 per cent to 6.16 per cent in a review of 10 series of cases comparing sarcoma to myoma. There has been considerable discussion in the past as to the histogenesis of this tumor. The problem was whether it arose from the muscle cells or the connective tissue. At present it is generally accepted that sarcoma arises from the muscle tissue. There is also the question as to whether the tumor arises from mature muscle cells or from undifferentiated cells found in the muscle wall. Most observers agree that sarcoma does not arise from mature cells. Novak[7] mentions the fact that all the constituent cells of the uterus are mesodermal in origin and therefore sarcoma could arise from any of these elements. This is also true for the mesodermal mixed tumor. It is upon a histogenic basis that these tumors are usually classified: (1) those arising in the muscle or connective tissues of the uterine wall; (2) those arising in myoma of either the corpus or cervix; (3) those arising in the mucous membrane of either corpus or cervix, and (4) those arising from the blood vessel apparatus. It must be remembered, however, that due to the aggressive tendency of sarcoma it will soon destroy any evidence as to its site of origin and make it difficult to classify these histogenetically. For practical purposes, then, the tumors are classified according to their microscopic appearance; namely, spindle cell, round cell, mixed cell and giant cell types. Even here difficulties arise because the cell type in different tumors and even in the same tumor may show various grades of differentiation making for difficulty in classification.

Grossly, sarcoma varies in appearance depending upon the location and histogenesis. When it arises in a myoma, which is the most frequent type, there are certain appearances which will suggest malignant changes. These malignant changes are usually near the center of the fibroid but may be noted occasionally at the periphery. The usual firm, grayish-white, fibrous appearing tumor is replaced by a homogeneous, soft, pinkish-gray tumor. There may be areas of necrosis and hemorrhage. Sometimes it is difficult to differentiate grossly sarcoma from myomas with degenerative changes. We must then resort to microscopic diagnosis. Here again cellular fi-

broids may cause difficulty in interpretation. Mural sarcoma may also appear as a nodular type of humor; this then makes it difficult to decide whether it arose in a pre-existing myoma. More commonly the mural sarcoma is diffuse and may give a uniform enlargement of the uterus which may mimic an early pregnant uterus.

Sarcoma of the endometrial stroma is much more uncommon than leiomyosarcoma. It is a type of tumor which is not generally appreciated and may be confused with those arising from the uterine musculature. Novak and Anderson[3] reported five endometrial sarcomas occurring among a series of 59 sarcomas of the body of the uterus. McDonald, Broders and Counseller[8] found 20 sarcomas which they thought arose in the endometrium during a period from 1904 to 1939 at the Mayo Clinic. The latter observers found the average age to be 50 years. The commonest symptom was vaginal bleeding. This was present in 17 of their cases. Other symptoms and signs noted rather infrequently were visualization of the tumor by protrusion through the cervix into the vagina, frequency of urination and an abdominal tumor. The symptoms were usually less than one year in duration. Grossly, the tumors were usually polypoid, projecting into the uterine cavity. The tumor may be diffuse. Occasionally, the tumor could be seen invading the muscle wall. In all but two patients the tumor was located in the region of the fundus. The two remaining sarcomas were located lower down in the uterus immediately above the external os. Histologically, the cells were spindle-shaped. Frequently there was ulceration and infection of the tumor. Large areas of necrosis were noted in the rapidly growing tumors. Many showed areas of myxomatous degeneration, this change being one not found in leiomyosarcomas and therefore was used as a differential point. Again, invasion of the muscle was present in all cases except two and the transition of normal stroma to neoplastic was evident in six cases. Within the tumor a few non-neoplastic endometrial glands could be found at the transition zone. These authors felt that this type of sarcoma is fibrogenic rather than a sarcoma sui generis. Reticulum stains are very helpful in differentiating this tumor from anaplastic carcinomas. In sarcomas the relation of reticulum to the tumor cells is very intimate and constant, the fibrils forming a delicate supporting stroma which penetrates between the individual tumor cells. This reticulum is formed by the tumor cells. In carcinoma the tumor cells do not produce new reticulum fibers. The prognosis in these cases was very poor. There was a recurrence of 66.6 per cent among those patients who were traced.

We recently had the occasion to observe a case of endometrial sarcoma at the Charity Hospital in New Orleans:

CASE REPORT

The patient was a 48-year-old white woman who was admitted to the hospital on January 16, 1941, with a chief complaint of vaginal bleeding. She had had regular menstrual periods every 30 days, lasting six or seven days, up until November 1940. Since this time she had bled almost continuously. Physical examination was negative except for a lacerated and chronically diseased cervix. The uterus was enlarged, firm and fairly good in position. The adnexae were negative. On January 23, 1941, some tissue was removed from the cervical canal which microscopically suggested sarcoma possibly of endometrial origin. On February 5, 1941, a total hysterectomy and a bilateral salpingoöphorectomy was performed. At the time of operation about 100 c. c. of a bloody fluid containing necrotic

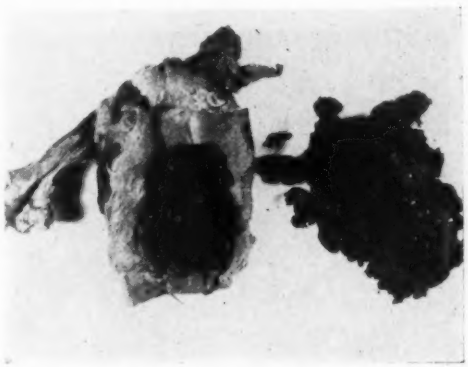

Fig. 1. Opened uterus showing the endometrial sarcoma attached to lower portion of uterine cavity in region of the internal os. The large mass of tissue adjacent to the uterus is necrotic tumor tissue which filled uterine cavity.

tissue was found free within the peritoneal cavity. The left tube and ovary were adherent to the recto-sigmoid, but could be easily separated. The uterus was somewhat enlarged and boggy. The uterine wall was thinned out and the endometrial cavity was dilated. Within the uterine cavity was a large friable, polypoid necrotic mass attached to the endometrium in the lower portion of the uterus (fig. 1). No definite gross evidence of invasion into the myometrium was noted. The left tube and ovary were adherent to each other by firm, red fibrous adhesions. The right tube and ovary were grossly normal. Microscopically this was a spindle

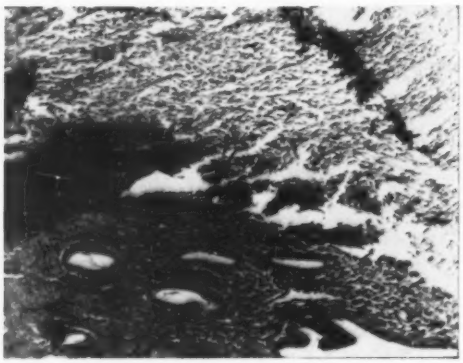

Fig. 2. Section at junction of sarcoma and normal endometrium showing the spindle cells and myxomatous appearance of the tumor.

type of tumor with areas of myxomatous changes and necrosis (fig. 2). At the junction of tumor with the endometrium occasional normal endometrial glands could be seen within the sarcoma but only at this site (fig. 3). Reticulum stains revealed the intimate relationship of tumor cells with reticulum

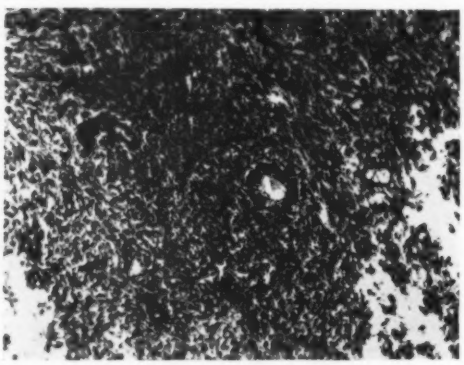

Fig. 3. Section of tumor in the vicinity of transition zone with normal endometrium, showing a few non-neoplastic endometrial glands in the sarcoma.

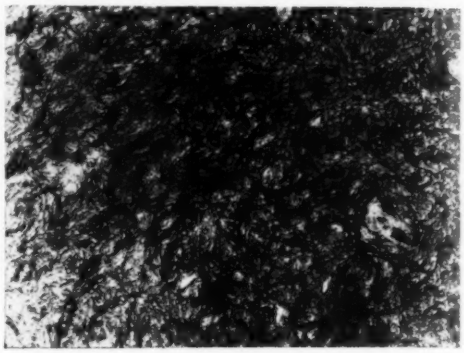

Fig. 4. Reticulum stain showing the prominent mesh of fibers.

seen in sarcomas of this type (fig. 4). The left ovary showed a few metastatic deposits in the cortex. The course of the patient following the operation was progressively downhill. She developed ascites and on tapping 3900 c. c. of bloody fluid at one time and 2600 c. c. of similar fluid at another time was obtained. In spite of transfusions, vitamins and irradiation she expired on March 29, 1941, 51 days following the operation. Unfortunately no autopsy was obtained.

OTHER SARCOMATA

Although the leiomyosarcomas and the endometrial sarcomas are the most frequent of mesodermal tumors found in the uterus, others have also been noted. Sarcoma botryoides, the grape-like tumor, of the cervix is a rare type. It was first described by Spiegelberg[9] in 1897. Although it may be found in adults, this malignancy has often been noted in infants. It may be noted as a grape-like, edematous mass of polyps involving the cervix and upper vagina.

Malignant mixed tumors of the uterus are diagnosed upon the demonstration of unusual tissues such as cartilage, bone or striated muscle. These tumors are very rare and are among the most malignant neoplasms of the body of the uterus. They occur almost always in women between 45 and 65 years of age. Most of these tumors are polypoid in gross appearance. As to the origin of these tumors some consider them to be malignant tumors of metaplastic origin, whereas others believe their pathogenesis depends upon multipo-

tential anlagen. The latter theory appears to be more correct.

Carcinosarcoma is not considered to be a collision tumor but one in which sarcomatous elements are mixed with carcinomatous cells. One must be careful here. It is often difficult to tell whether there are two separate elements or whether the epithelial cells have undertaken a sarcomatous appearance.

Other sarcomas which have been reported but are so rare that they will merely be mentioned are melanosarcoma, lymphosarcoma and angiosarcoma.

PROGNOSIS

The prognosis in sarcoma of the uterus varies with the type of tumor and the time of diagnosis. Those tumors which are slow growing are most amenable to treatment and possible cure. It appears that the best results are obtained in sarcomas arising in myomas. Even here women usually come for treatment when the disease is advanced. In rapidly growing sarcomata the prognosis is poor and the duration of life is rarely over three years. The grape-like sarcomata of the cervix are exceedingly rapid in growth, metastases occur early and the disease is almost always fatal. This is also true for the mesodermal mixed tumors of the uterus.

There has been some work done on the significance of mitoses as an indication of the degree of malignancy of uterine sarcomas. In 1920, Evans[10] made a study of this phase of the problem and concluded that the degree of mitotic activity parallels the clinical malignancy of these tumors. The conclusions arrived at were dependent upon actual mitotic counts. Kimbrough,[6] in 1934, came to a similar conclusion. He found that the small round cell and polymorphous tumors are more highly malignant than the spindle-celled type. Recurrences after operation were more than twice as frequent in a group of tumors showing a large number of mitotic figures as in tumors with relatively lower counts. Conversely, the five year salvage was almost four times as great in the low count groups as in the tumors which showed numerous mitotic figures. He felt that mitotic counts were of distinct value in prognostication of a case. As to treatment, it appears that radical surgery is best with radiotherapy used as a supplement.

SUMMARY

Sarcoma of the uterus, although not rare, is an uncommon tumor of the uterus. It may arise from any of the tissues of the corpus or cervix. The sarcoma which arises in myomas is usually less malignant than that arising in the general musculature of the uterus. The endometrial sarcomas are much less common than the muscle tissue tumors and are quite malignant. Mitotic counts appear to be of importance in determining the prognosis in a case of sarcoma of the uterus.

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NEW ORLEANS
Medical and Surgical Journal

Established 1844

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News material for publication should be received not later than the eighteenth of the month preceding publication. Orders for reprints must be sent in duplicate when returning galley proof.

Manuscripts should be addressed to the Editor, 1430 Tulane Avenue, New Orleans, La.

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THE NEW OFFICERS

The Journal published last month the names of the officers who were elected at the State Meeting in Shreveport. However, because of the necessity of going immediately to press, it was not possible to comment otherwise on the selections made by the House of Delegates.

Dr. Emmett Irwin, who was made President-elect to succeed the present splendid President, Dr. King Rand, is one of the best known doctors in New Orleans and the state. A man of delightful personality, Dr. Irwin has obtained an outstanding reputation as a surgeon. Forceful and dynamic, Dr. Irwin has held all the most important elective local offices, such as President of the Orleans Parish Medical Society and President of the New Orleans Graduate Medical Assembly. He has been a successful executive in whatever he has undertaken.

Dr. R. T. Lucas, who was selected as First Vice-president, is one of the prominent pediatricians in the state. Dr. Lucas was responsible for the splendid meeting that was held in Shreveport. As Second Vice-president, Dr. H. B. Alsobrook was elected. Dr. Alsobrook has maintained continuously an active interest in the state and parish organizations and has been a force for good in both organizations. Dr. Robert F. Sharp, Third Vice-president, is another New Orleans man liked and admired by all of his many friends.

Dr. J. Q. Graves, who has given outstanding service in the past as Delegate to the American Medical Association, was naturally re-elected and as his alternate Dr. Boni DeLaureal, a member of the City Board of Health, a teacher at Tulane and a prominent internist in New Orleans, was selected.

The Journal is particularly pleased to note that the four state Councilors who came up for re-election were unanimously re-elected. The names of DeGravelles, McMahon, Martin and Couvillion are names known to all members of the Society. These men have been active, conscientious and faithful in their duties as Councilors.

The selection of the committees showed excellent judgment on the part of the Delegates. Drs. Talbot, Fossier and LeJeune will make an excellent group to arrange for the scientific work of the organization. Dr. R. B. Harrison well deserved re-election as Chairman of the Committee on Public Policy and Legislation and the men who will work with him, Drs. Alsobrook, McMahon and the President and the Secretary-Treasurer ex-officio will carry out the mandates of the state organization in an efficient and capable manner. Dr. W. A. Ellender was elected to the Committee on Medical Defense.

The Journal is particularly fortunate in

that the House of Delegates saw fit to reelect Drs. Kostmayer and LeDoux to succeed themselves on the Journal Committee. These men have shown great interest in the conduct of the Journal and their help and advice have always been of extreme value. We are happy to announce that Dr. James K. Howles was elected to serve the unexpired term of the late lamented Dr. John A. Lanford.

The Journal feels confident that next year the activities of the Society will progress steadily forward. These new men, together with the officers who still hold office, will ensure a successful year for our organization.

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THE PAST YEAR OF THE JOURNAL

It has been suggested by the Journal Committee that it might be well to familiarize the members of the Louisiana State Medical Society with some of the details concerning the material published by the New Orleans Medical and Surgical Journal. In fulfilling this suggestion it might be said that in the year from May, 1940, to April, 1941, this information was given to the House of Delegates: There was a total of 109 scientific articles appearing in the Journal, making up 497 pages. Forty-six of these papers were articles presented before the Louisiana State Medical Society at its annual meeting, comprising 219 pages all told. Some 38 of the papers were presented before the Orleans Parish Medical Society, totalling 161 pages. In addition to these papers, 25 were original contributions submitted by authors, almost entirely Louisiana men who had observed, recorded, and reported.

In the section of the Journal not devoted to scientific business, there were 32 pages of editorials; 24 pages of hospital staff transactions and 32 pages of book reviews. Altogether there were 666 pages of reading matter, plus 296 pages of advertisements. From the notation of the number of papers presented, and by those who make a habit of reading the Journal, it can be observed that a large variety of subject was dwelt upon and presented to the state members.

Particularly encouraging is the appearance of articles from the members of the Society. The 25 papers that were presented represent a considerable increase over the past. On the other hand, it is somewhat discouraging to find that secretaries of hospital staffs do not and will not submit reports of their staff transactions. Before the average hospital staff monthly meetings there are often presented some extremely interesting cases, stimulating results and unusual pathologic conditions. Just a brief statement as to these conditions often suffices to bring out the highlights and to put on record something which, unless this is done, will be known only to the limited group of the hospital staff. Any and every hospital in the state is at liberty to have their staff transactions published in the Journal.

There were almost 64 pages of news of the Louisiana State Medical Society and 17½ pages of Orleans Parish news. This again is a source of discouragement. In spite of the fact that the secretaries of Parish and District Societies have been written to repeatedly, urging them to submit to the Journal the details of their meetings, the doings of their fellow practitioners and information which is of interest to most readers, it is almost impossible to secure the cooperation from more than one or two men in the state. The news items are always read with interest; they will be scanned when scientific material is neglected. They sometimes bring out information which could not be obtained in any other way about the friends and practitioners removed some distance from their confrères. Again it is earnestly urged that the secretaries cooperate with the Journal Committee in sending to the editor information about their local society and their local medical men.

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COUNTER PRESCRIBING

The difficulty that has occurred in the effort to trace down a batch of improperly compounded sulfathiazole has been brought about in part by the fact that some of the supply apparently was sold over the coun-

ter to lay individuals. The doctor of medicine is wont to inveigle against the druggist because he does prescribe or at least sells medicine which is pharmacologically active, possibly toxic and very possibly poisonous if taken in several large doses. Any drug that has a definite action on the human organism is potentially dangerous. The druggist is by no means the only one to blame for the promiscuous distribution of pharmacologic preparations which may be detrimental. The doctor is equally at fault, perhaps more so because he has had a scientific training and realizes that promiscuous prescribing may be harmful. The big wholesale drug houses are quite active in pointing out that the physician is harming himself and hurting his practice when he verbally gives a patient an order to buy such and such a drug over the counter. It is so much simpler and easier to say to a patient "get a bottle of blank and take one tablet every night" than it is to sit down, write a prescription and give the official name of the preparation. After the patient is told to buy this or that, the next time he gets it he will probably go directly to the druggist. Furthermore, he is just as likely as not to tell his friends that a particular medicine is valuable and advise them to take it. The consequence is that the physician loses money, an office visit and many a patient because of his carelessness in advising the patient to buy medicine without a prescription.

The tremendous growth in the sale of aspirin is a splendid example of popularizing a drug largely through the doctor. Aspirin originally was offered only to the physician and pharmacist. Most of the barbiturates which have trade names are bought at the present time by the patient without the advice of a physician and of course without a prescription.

The doctor, in justice to himself and to his fellow practitioners, should avoid using trade names; he should use the official name in writing a prescription; he should not prescribe potent preparations over the telephone or tell the patient to buy them by the trade name; he should avoid sidewalk consultations with promiscuous advice to take something or another when he may not know what is the underlying cause of his consultor's complaint.

Lastly, the dispensing of samples handed out to the patient by the doctor is becoming an unmitigated evil. The patient is given a sample in the original package and finds that the preparation is successful with himself; when he wants more he takes the original package to the druggist and asks that the pharmacist give him more of the same. He also is prone to treat his friends, assuming that because a certain preparation he has been given has effected a relief of symptoms in his case it will do the same for the friend and his same symptoms. This applies particularly to the antiacid preparations which are distributed right and left by the pharmaceutical houses that make them. The doctor would do well to order, on his own prescription blank, the pharmacist to dispense the preparation that he wishes to try rather than simply pulling out the drawer and handing it out to the patient.

PERIPHERAL NEURITIS PRODUCED BY THE SULFONAMIDES

An article in a recent number of the Journal of the American Medical Association seems of sufficient importance to comment upon and to call the attention of the medical profession to the subject matter of this provocative paper. It represents a study that was made by a group in Minneapolis relative to nerve injuries produced by the sulfonamide series.

The authors* comment on the fact that from time to time nerve injuries have followed the employment of this widely used group of drugs. Peripheral neuritis is by no means unknown. They have drawn an analogy between the different chemical forms of the sulfonamides with the different arsenical preparations, some of which may produce nerve injury to a much

*Bieter, R. N., Baker, A. B., Beaton, J. G., Shaffer, N. J., Seery, T. M., and Orr, B. A.: Nervous injury produced by sulfanilamide and some of its derivatives in the chicken, J. A. M. A., 116:2231, 1941.

greater extent than do others. In this study the concentration of the several sulfonamide preparations in the blood, in a peripheral nerve (sciatic), the spinal cord, brain, liver and kidneys was determined quantitatively. They state that a cumulation of at least four of these drugs may occur in the sciatic nerve. The three least injurious are sulfanilamide, sulfapyridine and sulfathiazole. The other chemical preparations now being employed for clinical use are progressively more injurious than these first three.

Merely because an occasional relatively severe case of peipheral neuritis follows the use of sulfonamide therapy is no reason to do away with the use of these drugs in people having serious infections which require their administration. However, this work simply is an additional reason why the sulfonamides should not be used promiscuously. They are drugs that have powerful action and may have deleterious aftereffects. The benefits that have been brought about are spectacular but caution should be employed in making use of the sulfonamides unless there are definite indications for them.

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HOSPITAL STAFF TRANSACTIONS AND CLINICAL MEETINGS

TOURO INFIRMARY
New Orleans

The regular monthly meeting of the Medical Staff was held on Wednesday, May 14, at 8 p. m. The meeting was opened by a clinico-pathologic conference conducted by Dr. S. H. Colvin. The remainder of the scientific program included a case report of "Complete Heart Block Following Coronary Infarction, with Recovery" which was presented by Dr. B. R. Heninger. Dr. Manuel Gardberg reported a series of "Cases of Coronary Disease — Electrocardiographic Diagnosis." Included in the scientific program were moving pictures shown by the Winthrop Chemical Company.

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SOUTHERN BAPTIST HOSPITAL
New Orleans

The regular monthly meeting of the Clinical Staff was held on Tuesday, May 27, in the Staff Room. The program consisted of the following presentations: "Congenital Transverse Vaginal Septum; Ovarian Cyst; Pregnancy and Transverse Presentation" by Dr. H. B. Alsobrook; "Plasma and Plasma Protein" by Dr. Hilaire Ogden; "Neonatal Death Due to Hemorrhage from Liver" by Dr. E. L. King.

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LOUISIANA STATE MEDICAL SOCIETY NEWS

CALENDAR

PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Orleans	Second Monday of every month	New Orleans
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	

REPORT OF THE HOUSE OF DELEGATES TO THE GENERAL ASSEMBLY OF THE LOUISIANA STATE MEDICAL SOCIETY

SIXTY-SECOND ANNUAL SESSION
Shreveport, April 21-23, 1941

Submitted herewith is resumé of action taken by the House of Delegates in session during the 1941 meeting of the State Society:

Motion was made and carried to withdraw the resolution offered at the 1940 meeting of the House of Delegates to amend the Charter, Constitution and By-Laws deleting the mention of "material interests" as one of the benefits offered by the Society.

Dr. W. H. Browning, Vice-president of the Board of Institutions addressed the meeting, after which motion was made and carried that a special committee, composed of the Committee on Mental Health, Committee on Hospitals and Committee on Public Policy and Legislation, be appointed to study the report made by Dr. Browning and make a report to the next meeting of the Executive Committee.

Amendments

Motion was made and carried that the recommendation of the Special Committee in re Term of Full Time Secretary that the Charter be amended to state that the secretray-treasurer shall be elected for a term of not more than five years, be adopted.

The report of the Committee on the Secretary-Treasurer's Report wherein it was recommended to approve the recommendation to amend Section 7 of Article IV of the Constitution omitting the phrase "physicians legally qualified to practice medicine in the State of Louisiana," so that first year interns will be qualified for membership, was accepted.

In accordance with recommendations offered by the Committee on the Care of the Indigent Physician and the Committee on Public Policy and Legislation, motion was made and carried that the By-Laws be amended to read "Each member shall pay into the Society an annual assessment of seven dollars and a half ($7.50), which shall constitute his membership dues . . . " This amendment was made in order to increase the amount in the Indigent Physicians' Fund and to provide additional funds for legislative purposes. *In accordance with action taken by the House of Delegates, one dollar of the increased amount of dues for each member will be allocated to the indigent physicians' fund and fifty cents to the legislative fund.*

Recommendations contained in the following reports were acted upon:

Report of President

1. Continue to recommend and obtain the best men possible for the various state and municipal medical positions: Approved.

2. To keep harmonious relations between the physicians of the state and those individuals occupying key medical positions to the end that this cooperation will elevate and improve the character of medical achievements and practice of medicine for the best interest of the public: Approved.

3. Be cautiously on the alert for any signs of socialized medicine: Approved, with emphasis.

4. Support in every way the national emergency by urging and requesting all eligible physicians to assume their just responsibilities as the medical profession has so conspicuously done in the past: Approved.

5. Give to the full time secretary that full cooperation and confidence so essential for the successful performance of his duties, thus encouraging him in his new efforts. Lengthen the term of this office by removing the restriction of two years. It is wholly unfair to expect Dr. Talbot or any other physician of ability to give up his private practice and to disassociate himself from the many duties, responsibilities and contacts, and the Society, after two years, to discontinue his employment: Approved.

6. To authorize the president to appoint a committee to study the possibility of creating a pension or retirement fund for members who choose to avail themselves of such a privilege after having practiced medicine for definite periods of time: Approved.

Report of Secretary-Treasurer

1. If it is desired that doctors serving first year internship be accepted as intern members, that Section 7 of Article IV of the Constitution be amended omitting the phrase "physicians legally qualified to practice medicine in the State of Louisiana": Approved.

Report of Councilor of Third District

1. That these courses (extension courses in practically all branches of medicine) continue and to thank those responsible for this work: Approved.

Report of Councilor of Fifth District

1. It would not seem inappropriate at this time to state, in view of the tremendous expenditure of Federal funds for various services rendered for all other types of work, that it is our opinion that all physicians rendering service as examiners for the various draft bodies should be compensated for their work. We would favor a resolution looking toward this end: Tabled.

Report of Committee on Cancer

1. To reaffirm the activities of the Cancer Committee: Approved.

2. To appropriate two hundred dollars ($200.00) for expenses for the year 1941: Referred to the Budget and Finance Committee with recommendation that it be approved if feasible.

3. That the Secretary-Treasurer write a letter to the newspapers in Alexandria, Lake Charles, Monroe, Lafayette, Baton Rouge, and Shreveport which have published articles on cancer control and to the radio stations in Alexandria, Lake Charles, Monroe, Baton Rouge, Shreveport, and New Orleans which have given time for radio talks on cancer, thanking them for their cooperation. It is also recommended that a letter of thanks be sent by the Secretary-Treasurer to Dr. J. H. Musser, Director of the Louisiana State Health Department, for the donation of space in the Journal for the publication of monthly articles on the subject of cancer: Approved.

Report of Committee on Care of the Indigent Physician

1. That the annual dues of the Society be increased one dollar ($1.00) per member; this extra dollar to be allocated to the Fund for the Care of the Indigent Physician: Approved.

At the last session of the House of Delegates the chairman of the Committee on Care of the Indigent Physician stated that he understood that a wrong impression had been created to the effect that money appropriated to the Indigent Physicians Committee was deflected by the Budget and Fi-

nance Committee. He said that this was not so; that the House of Delegates appropriated the money to other purposes, and that he wished to make this comment so that there would be no further misunderstanding in the matter. Motion was made and carried that the delegate who stated he was under this impression should be notified of the report refuting this statement.

Report of Committee on Maternal Welfare

1. That field workers should have a refresher course two weeks annually, in an obstetrical hospital or on the obstetrical floor of some hospital, where they can observe and refresh themselves on newer methods in the care of obstetrical cases: Approved.

2. That the component societies of the State Society be requested to have several papers before meetings, relative to maternal welfare in order to further the idea of adequate prenatal and postnatal care: Approved.

3. That the Shreveport Charity Hospital be included in the institutions which should have special residents in obstetrics and gynecology: Approved.

Report of Committee on Mental Health

1. Your committee would recommend that you endorse this report with the qualifications mentioned: Referred to the special committee composed of the Committee on Mental Health, Committee on Hospitals and Committee on Public Policy and Legislation.

Report of Committee on Tuberculosis

1. The Louisiana State Medical Society Committee on Tuberculosis, appointed by the President of the Society, should serve in an advisory capacity to the Director of the Department of Institutions of the State of Louisiana, on problems pertaining to the care of tuberculous patients in our state: Approved.

2. Additional beds for the care of tuberculosis should be provided on a district basis as suggested: Referred to Committee on Hospitals.

3. In each of the seven unit centers clinics for the diagnosis and ambulatory treatment of tuberculosis, including artificial pneumothorax, should be established: Referred to Committee on Hospitals.

4. The necessary laboratory facilities for diagnosis should be provided in each of these centers for the use of physicians of the district: Referred to the Committee on Hospitals.

5. Major surgical collapse procedures are to be carried out at the centers located in New Orleans and Shreveport: Referred to Committee on Hospitals.

6. Tuberculosis wards should be provided in mental and penal institutions for the adequate care of inmates affected with this disease: Referred to Committee on Hospitals.

7. An annual report should be made by the Department of Institutions to the Louisiana State Medical Society, through the Committee on Tuberculosis: Approved.

Report of Committee on Walter Reed Memorial

1. In lieu of a memorial to Walter Reed that an annual prize, in the form of a medal, be offered each year to a senior student at L. S. U. and at Tulane who write the best thesis on tropical disease and preventive medicine; the heads of the departments of tropical medicine at Tulane and L. S. U. to select the best thesis: Approved.

Report of Committee on Public Policy and Legislation

1. That some financial arrangement be made for legislative work to pay for an all-time individual at the legislature and also so as to have the advice of an attorney in this connection: Approved.

2. (Suggestion) That any member of the Louisiana State Medical Society found present at the legislature opposing the wishes of the Louisiana State Medical Society should be asked to resign: Amended to the effect that any member of the State Society who is in direct opposition to the recommendations of organized medicine be referred to the house of Councilors for action.

Report of Special Committee in re Term of Full Time Secretary

That the Charter be amended to state that the secretary-treasurer shall be elected for a term of not more than five years: Approved.

After a verbal report by a member of the Committee to Prepare the History of the State Society, motion was made and carried that the Chairman of the House of Delegates write a message of appreciation to Dr. Matas, for his tireless effort in producing for Louisiana such an outstanding contribution of the history of medicine.

The suggestion in the report of the Louisiana State Board of Medical Examiners that due to the fact that the medical students' condition in regard to the draft is not clarified, some suitable resolution be adopted by this body in reference to the question, was approved. Such a resolution was submitted and approved. Motion was made and carried that Dr. R. W. O'Donnell and Dr. F. C. Bennett be recommended for appointment on the Board of Medical Examiners.

The following reports, which contained no recommendations, were accepted: Council, Councilors of First, Second, Fourth, Sixth, Seventh and Eighth Districts; Delegate to 1940 meeting of A. M. A.; Fraternal Delegate to 1940 meeting of South Carolina Medical Association; Fraternal Delegate to 1940 meeting of Texas Medical Association; Advisory Committee to Woman's Auxiliary; Committees on Hospitals, Journal, Medical Defense, Medical Education, Scientific Work, and Resolutions; and Committee to Prepare History of State Society.

Motion was made and carried that telegrams be sent to Drs. H. E. Bernadas, F. J. Chaloron

and D. C. McBride, who were unable to attend the meeting due to illness.

Dr. Alvis Greer, of Houston, Fraternal Delegate from the Texas Medical Association, brought greetings from his association.

A communication received from the Orleans Parish Medical Society, including a communication regarding unjust criticism of the profession in the city and state was presented and motion was made and carried that the communication be favorably received and the House express its appreciation and confidence; also that copies of the communication be sent to the Governor, Lieutenant Governor, Director of the Department of Institutions and to the Journal for publication.

A motion that the secretary be empowered to change the type of badge used by the Society for the past several years was tabled.

An amendment to the By-Laws that Section 4 of Chapter XIV, concerning medical defense, in which it is stated "the committee shall have full authority governing all matters pertaining to the Medical Defense features of this Society . . . " by adding "making it mandatory for this committee to employ a local counsel for the doctor in difficulty" was offered. This amendment was not unanimously approved and due to the fact that it was submitted at the last session of the House, will have to lay over until the 1942 meeting for final action.

A telegram from one of the delegates of the Mississippi State Medical Association, extending invitation to members of the Louisiana State Medical Society to attend the 1941 Mississippi meeting to be held in Biloxi in May, was received.

Motion was made and carried that letters be sent to Lieutenant Governor Mouton, Drs. E. M. Toler, Holderith and Fernandez, and other physicians in the House and Senate, expressing thanks for their assistance.

The question of dedication of future meetings of the Society was referred to the Executive Committee.

The following officers were elected:

Dr. Emmett L. Irwin: President-elect.

Dr. R. T. Lucas: First Vice-President.

Dr. H. B. Alsobrook: Second Vice-President.

Dr. Robert F. Sharp: Third Vice-President.

Dr. Val Fuchs: Chairman of House of Delegates.

Dr. A. W. Martin: Vice-Chairman of House of Delegates.

Dr. C. C. deGravelles: Councilor Third District.

Dr. Rhett McMahon: Councilor Sixth District.

Dr. C. A. Martin: Councilor Seventh District.

Dr. W. F. Couvillion: Councilor Eighth District.

Dr. J. Q. Graves: Delegate to A. M. A. 1942-43.

Dr. Boni deLaureal: Alternate delegate to A. M. A. 1942-43.

The following members of committees were elected:

Scientific Work: Drs. P. T. Talbot, Chairman; A. E. Fossier and F. E. LeJeune.

Public Policy and Legislation: Drs. Roy B. Harrison, Chairman; H. B. Alsobrook, Rhett McMahon, King Rand and P. T. Talbot.

Journal: Drs. H. W. Kostmayer, L. A. LeDoux and J. K. Howles.

Medical Defense: Dr. W. A. Ellender.

Invitation was accepted to hold the 1942 meeting in New Orleans.

Respectfully submitted,

P. T. Talbot, M. D.,
Secretary-Treasurer.

COMMUNICATIONS

Because of its importance, we reprint here copy of letter and enclosed amendments and proposed amendment which Dr. Talbot recently sent out to all members of the State Society.

Dear Doctor:

Enclosed is copy of proposed amendment to the Charter of the State Society, offered at the 1941 meeting recently held in Shreveport. This amendment changes Article V by adding "for a term of not more than five years," after "Secretary-Treasurer." Final action on this amendment will be taken at the 1942 meeting of the Society.

Enclosed also is copy of amendment to the Constitution which was approved at the 1941 meeting. This amendment deletes "Physicians legally qualified to practice medicine in the State of Louisiana" at the beginning of Section 7 of Article IV.

A copy of the amendment to the By-Laws which was approved at the 1941 meeting is also sent herewith. This amendment was made in order to increase the amount in the Indigent Physicians' Fund and to provide additional funds for legislative purposes. In accordance with action taken by the House of Delegates, one dollar of the increased amount of dues for each member will be allocated to the Indigent Physicians' Fund and fifty cents to the legislative fund.

The members of the House of Delegates were agreed that the increase in dues for these two purposes was thoroughly justified and it is hoped that you will realize the importance of increasing the amount in these funds and assist by paying your membership dues promptly at the time when due. The increase in dues will be effective in 1942.

Your cooperative will be greatly appreciated.

Yours very truly,

P. T. Talbot, M. D.,
Secretary-Treasurer.

PROPOSED AMENDMENT TO CHARTER

Article V—The offices of this corporation shall be a President, President-elect, three Vice-Presidents, Secretary-Treasurer and Councilors, one from each councilor district, the Chairman of the House of Delegates, the Vice-chairman of the House of Delegates and the retiring President of

the Society. These officers, and the members to be presented to the Governor for appointment on the State Board of Medical Examiners, shall be elected by the House of Delegates at the annual meeting by a majority vote of the delegates present. The President, President-elect, Vice-Presidents, Chairman of the House of Delegates and the Vice-Chairman of the House of Delegates shall be elected for a term of one year; the Secretary-Treasurer shall be elected for a term of not more than five years; the Councilors shall be elected for terms of two years each, being divided into two groups so that as nearly as possible one-half shall be elected annually. At the first election, one group shall be elected for one year, and the other group for two years, and thereafter each group shall be elected for two years. All of the officers shall serve until their successors are elected and installed. No person shall be elected to any office who is not in attendance upon the annual session, and who has not been a member of the Society for the past two years. The officers elected at the last annual meeting shall hold office under this Charter until their successors are elected and installed. Vacancies due to death, resignation, or other causes, shall be filled for the unexpired term by appointment of the Executive Committee. The Executive Committee shall also recommend names to the Governor for vacancies occurring by death, resignation or removal on the State Board of Medical Examiners between the annual session.

AMENDMENT TO CONSTITUTION
ARTICLE IV

Section 7. Intern Members—Physicians serving internships in accredited hospitals shall during their period of internship be eligible to membership in this Society through their respective component societies as Intern Members. They shall not be entitled to medical defense, nor shall they be eligible to hold office or vote. Dues for Intern Membership shall be $1.00 per year. (April, 1941).

AMENDMENT TO BY-LAWS
CHAPTER IX

Assessments and How Payable

Section 1.—Each member shall pay into the Society an annual assessment of seven dollars and a half $(7.50), which shall constitute his membership dues. Those specifically exempted in the Constitution shall not be liable for this assessment. Intern members shall pay the sum of one dollar ($1.00) per annum. Of the amounts collected from active members, one-half dollar (50c) per capita shall be set aside as an annual entertainment fund, any surplus of which shall be paid into the Indigent Physicians' Fund. In addition, one-half dollar (50c) per capita shall be paid from the dues collected from active members into the Medical Defense fund. After the first day of October of the current year new members admitted to the Society shall pay one-quarter of the annual dues for the fiscal year. (April, 1941).

The following communication was received favorably by the House of Delegates at the meeting in Shreveport. The House instructed the Secretary-Treasurer to have a copy of this letter sent to the Governor, Lieutenant Governor, and Director of Institutions, and ordered that it be published in the Journal:

New Orleans
April 10, 1941

To the House of Delegates
Louisiana State Medical Society
Gentlemen:

At a recent Board Meeting of the Orleans Parish Medical Society the enclosed letter was presented for consideration.

Since this is a state matter it was motioned and passed that the communication be referred to the House of Delegates for their consideration, at their meeting in Shreveport, April 21-23.

Thanking you for any attention given this letter, we remain,

Yours very truly,
Signed: Edwin L. Zander, M. D.,
Secretary.

New Orleans
April 1, 1941

To the Officers
The Orleans Parish Medical Society
Gentlemen:

In the past months the medical profession of the State, and especially of the City, has been the recipient of many unfair remarks and unjust criticism, in the investigation and reports on various boards and institutions.

In taking cognizance of these remarks it is not our purpose to assume an egotistical attitude, nor act for any selfish motives, but to acquaint the public of the injustice of the statements made in these reports relative to the competency of our profession.

We strongly endorse any sincere effort for the complete depoliticalization of all public medical health services, which is not of a sporadic nature for political expediency.

We are emphatically in favor of any investigations of public institutions made by qualified and unbiased investigators with this object in view.

There may have been some administrative inefficiency or political subserviency in the past by a few members of our profession, who secured their appointment not by the recommendation of organized medicine, but from a political standpoint.

Physicians of our State have served, and do serve with honor, in the highest offices in local, national and international organizations and institutions. In a like manner, they have served in teaching positions, health, military and civic organizations and movements; and, it is natural that we resent the insinuations in these reports; that no member of our local profession is sufficiently

qualified, capable or trained to aspire to positions of leadership and trust.

Many of our members have held with credit executive and administrative positions, or have been associated directly with these institutions for many years; surely these physicians are more competent to know the requirements of the institutions than outsiders, who appear in some cases to be novices.

It is a sad reflection on the part of the medical profession that physicians, who have demonstrated their capability and integrity in institutions, or other allied medical or civic organized movements, where many have served, without compensation, on various boards, committees or actively worked for numerous years, are told that not one is capable of leadership.

Again, the physician who has lived and practiced for years in his community, who has virtually been on the "firing line", has a more sympathetic and broader aspect of health problems, than a desk administrator.

For discussion, if our profession lacks sufficient training, the fault lies not in medical ranks, but in our political system which gives no assurance to the honest and capable physician that his position will not change with each administration. There is no incentive for our younger physicians to fit themselves for such positions, when they observe the fate of their older confrères.

Until such positions are given merit, and are administered for public welfare, and not as political pawns, we can expect no change.

In comparison: Governors, Mayors and our other highest officials, with much greater responsibilities, are selected with no special training for their office, and in many cases selected at random from the public with no special qualifications.

These investigations are usually made by persons with no knowledge as to the ability, training, or integrity of our local profession. They have no direct contact with medical organizations, nor do they seek it. The medical profession is judged without trial.

I would request that this letter be referred to the proper committee or proper person for consideration, with the hope that it will correct some of the injustice which has lately befallen our profession.

Fraternally yours,
Signed: Edwin L. Zander, M. D.

REPORT OF COMMITTEE ON MEDICAL DEFENSE

During the past year the Committee on Medical Defense has handled, through the attorney employed as counsel, three medical defense cases. The present status and action taken in reference to these cases is as follows:

A case involving a physician in Bogalusa, which was referred to the committee in March, 1939, is still pending and in January of this year the attorney advised us that the doctor was ill and requested that we secure statements from attending physicians, stating whether or not, in their opinion, this member was able to testify in court at the present time. These opinions were secured and forwarded to the attorney who has advised us that he has succeeded in getting the trial postponed for three months, at the end of which time the case will be tried without the doctor being present if he is still ill.

A case presented to the committee in July of last year, concerning a Lake Charles physician, is receiving the attention of the attorney, who has filed exceptions on behalf of the doctor.

In May, 1940, a case, brought against a New Orleans physician, was compromised, after authority was granted by our committee, thus closing the case.

A request for information, concerning procedure in securing medical defense through the State Society, was received from a Monroe physician in June, 1940. The doctor stated that he was threatened with a suit and although all necessary information was transmitted to him, the committee has not been contacted further by this member in this regard.

Attached to the original report is report of the Medical Defense Savings Account for 1940 and also a list of the securities held in the Trust Department of the Whitney National Bank for the Medical Defense Fund, as of December 31, 1940.

Respectfully submitted,
S. Chaillé Jamison, M. D.,
Chairman.

THE GOLF TOURNAMENT OF THE LOUISIANA STATE MEDICAL SOCIETY

Low Gross Score—81—Val H. Fuchs—New Orleans—DeLuxe Golf Bag; Runner Up Low Gross Score — 92 — J. V. Hendrick — Shreveport — All Leather Golf Bag.

Low Net Score—71—E. L. King—New Orleans—Cocktail Set; Runner Up Low Net Score—P. Graffagnino—New Orleans—Electric Razor.

Low Gross 6 B Holes—C. P. Rutledge—Shreveport—All Leather Carry All; Runner Up Low Gross 6 B Holes—R. F. Sharp—New Orleans—DeLuxe Toilet Set.

High Gross Score—115—H. A. Thomas—New Orleans—Desk Set; Runner Up High Gross Score—I. B. Rougon—Shreveport—Pr. Spaulding Golf Shoes.

High Net Score—91—W. B. Heidorn—Shreveport—Golf Umbrella; Runner Up High Net Score—88—M. C. Wiginton—Hammond—DeLuxe Tie.

High Gross 9 Holes—H. A. Folse—Donaldsonville—Waterproof Golf Hat.

Most Fives—L. A. Fortier—New Orleans—DeLuxe Lounging Jacket.

Most Sixes—S. W. Rozas—Opelousas—Golf Umbrella.

Most Sevens—J. T. O'Ferrall—New Orleans—Golf Umbrella.

The "also rans" Drs. J. H. Musser, E. H. Lawson and Howard Mahorner, all of New Orleans, who were too delicate or lacking in "intestinal fortitude" to brave the rain and finish playing the last nine holes were awarded by the committee, Six Golf Balls each for showing their colors.

TANGIPAHOA PARISH MEDICAL SOCIETY

The regular meeting of the Tangipahoa Parish Medical Society was called to order by the president in Hammond in May. There was a large attendance, and the meeting, though long, was enjoyed by all.

Dr. T. Spec Jones, of Baton Rouge, presented a very interesting and excellent paper on "Disease of the Thyroid Gland." The paper was enjoyed by everyone and the Society hopes to have Dr. Jones as a guest soon again.

Dr. R. F. Gates, head of the Florida Parishes Hospital, presented a report of six cases of ectopic pregnancy admitted recently to this institution. These case reports were so enthusiastically received by the members that Dr. Gates was asked to have more such cases for future meetings.

S. J. Cali, M. D., Sec.

CANCER: A CHALLENGE TO EVERY LOUISIANIAN

For five years the Louisiana Division of the Women's Field Army of the American Society for the Control of Cancer, has been doing valiant work in its educational program giving the lay public the true facts about cancer, its prevention and cure. In those parts of Louisiana where the Field Army has been well supported and developed through the fine cooperation of the medical profession and the women interested in cancer prevention, definitely favorable results have been obtained.

Unfortunately in relatively few parishes has the work been even fairly well developed. In too many parishes the work has been neglected or only half-heartedly supported. Primarily this appears to be due to a lack of interest on the part of the medical profession. Perhaps this is not surprising as most doctors see only one or two cases of cancer each year, and therefore the disease plays a minor role in their practice. But in the aggregate, cancer ranks second as a cause of death in Louisiana. If for no other reason it should be of the greatest interest to every doctor regardless of the number of cases he sees in his personal practice. Because of this lack of professional interest which may be more apparent than real, women who have keenly desired to further the educational program of the Women's Field Army have had their enthusiasm dulled and have lost interest in the movement. Thus, the program has lagged and has been ineffective in many parts of the state. This is an unfortunate situation as it tends to nullify the good work done in the better organized parishes. However, it is the writer's belief that it can be overcome if the enthusiastic support of the rank and file of the medical profession is once obtained.

For nearly ten years there has been much discussion of so-called "socialized medicine." In general the medical profession has been pictured in an unfavorable light in spite of the fact that general health conditions in this country have been the best in history and are constantly improving. In seeking an explanation for this paradox, it becomes evident that many lay leaders believe that the medical profession has shown a relatively high degree of inertia in developing preventive measures for many diseases. Thus they believe that in the past the knowledge possessed by the medical profession warranted more rapid progress in the control of such conditions as heart disease, maternal mortality, tuberculosis, and diphtheria, than was actually obtained. Because of the profession's failure to assume vigorous leadership in the campaigns to control these conditions, lay leaders assumed command. Today to a certain degree the same condition is true of cancer. They expect the leadership of the medical profession, but if it is not forthcoming they will seek other methods of obtaining the desired results. If they do so, the medical profession will necessarily lose prestige. Therefore as individuals and as societies, the profession should gladly and wholeheartedly assume the leadership in this campaign against cancer, not in a few parishes but in every one of the 64 parishes in Louisiana.

The control of cancer, like the control of many other diseases, is a community problem and requires the enthusiastic cooperation of the doctor in his professional capacity as well as a citizen with other lay citizens who desires such control. It is hoped that this year every doctor will take a personal interest in developing the educational program against cancer. They can do so by encouraging the women in their work, by aiding them in organizing lectures and becoming contributing members of the Women's Field Army and by encouraging their friends to enlist. For five years the work has been handicapped by inadequate funds. If every doctor, his wife and one friend enlisted, we would have half the funds considered necessary to develop fully the educational program of the W. F. A. If this were done we are confident the women of Louisiana would raise the remainder. It is in this way that Louisiana should commence to answer the challenge of cancer. Thus we shall begin to attain our goal, that of reducing cancer mortality in Louisiana by one-half to one-third.

The 1940-41 enlistment campaign closes June 15; checks may be addressed to the Louisiana Division, Women's Field Army, 1430 Tulane Avenue, New Orleans, La.

Edwin H. Lawson, M. D., Chairman,
Committee on Cancer.

U. S. CIVIL SERVICE EXAMINATIONS

Public health nurses at $2,000 a year and graduate nurses for general staff duty at $1,800 a year are needed by the Civil Service Commission. On account of the lack of nurses, applications, until further notice, will be received continuously.

SAVE YOUR RUBBER

A campaign is under way to save all rubber for the benefit of national defense. Hospital superintendents should make note of this and individual doctors might also be of help in salvaging rubber. A considerable amount of money can be realized from the sale of this rubber to scrap dealers, by whom it will be routed to commercial reclamation plants where it can be subsequently used. Rubber goods of any kind, worn rubber gloves, bottle stoppers, tubing, Asepto and ear bulbs, in fact any kind used in hospitals and in doctors' offices, should be saved.

1941 GRADUATE FORTNIGHT OF THE NEW YORK ACADEMY OF MEDICINE

The Graduate Fortnight of The New York Academy of Medicine will be held from October 13-24, 1941.

The purpose of the Fortnight is to make a complete and authoritative presentation of a subject of outstanding importance in the practice of medicine and surgery. The subject this year is "Cardiovascular Diseases Including Hypertension."

The Fortnight will present a carefully integrated program which will include morning panel discussions, afternoon clinics and clinical demonstrations at hospitals of New York City, evening addresses, and a scientific exhibit. The evening sessions at the Academy will be addressed by recognized authorities from leading medical centers of the United States and Canada. The comprehensive exhibit will include books and roentgenograms; pathologic and research material; clinical, laboratory, diagnostic and therapeutic methods. There will be demonstrations of exhibits and of fresh pathology.

LOUISIANA STATE CORONERS' ASSOCIATION

At the annual meeting held at the time of the Shreveport meeting of the State Society, Dr. J. B. Hall, of Bossier, was elected president; Dr. L. L. Ricks, of Independence, was re-elected secretary-treasurer; Dr. C. J. Barker, of Thibodaux, was elected first vice-president, and Dr. R. F. DeRouen, of New Iberia, second vice-president.

LOUISIANA STATE PEDIATRIC SOCIETY

At the annual meeting held in Shreveport, April 21, the following officers were elected: Dr. Julian Graubarth, of New Orleans, president; Dr. W. B. Worley, of Shreveport, vice-president; Dr. W. C. Rivenbark, of New Orleans, secretary-treasurer.

A full time intensive course in electrocardiography will be given August 18-30 by Dr. Louis N. Katz of the Cardiovascular Department of Michael Reese Hospital, Chicago. Fee for the course is one hundred dollars.

The Louisiana-Mississippi Ophthalmological and Otolaryngological Society met in April at the St. Charles Hotel, in New Orleans. An interesting program was presented by four essayists: Dr. L. V. Johnson, of the School of Medicine of Western Reserve University; Dr. Neal Owens, of New Orleans; Dr. George E. Shambaugh, Jr., of Chicago; Dr. A. C. Furstenberg, of the University of Michigan.

NEWS ITEMS

Any physician who is interested in partnership and association with two other physicians in a Texas town of 6,000 population with only two other doctors, can obtain information from the office of the Journal.

Large furniture factory four miles from Mobile, Alabama, desires physician between forty and forty-five years of age, well recommended, to live at plant. Salary will amount to about five thousand dollars a year with privilege of outside practice. For further information write Mr. F. W. Reimers, Hammond, La.

A physician in Paradis, Louisiana, desires to give up practice due to illness and wishes a doctor between forty and fifty years of age to assume his practice. Further information may be secured at the office of the State Medical Society.

Dr. Lucien A. LeDoux, Councilor from Louisiana of the Southern Medical Association, attended a meeting of the Executive Committee of the Council in St. Louis, Missouri, on May 13. The annual meeting of the Southern Medical Association will be held in St. Louis, November 11-15, with headquarters at the Hotel Jefferson.

Dr. Theodore A. Watters, Assistant Professor of Psychiatry and Neurology at Tulane University Medical School, has been elected to Fellowship in the American Psychiatric Association.

Dr. Henry W. E. Walther was elected President of the Louisiana Urological Society at their annual meeting in Shreveport on April 21, 1941.

Dr. Roland Young recently spent two weeks in Philadelphia and New York. While in the East he attended the Philadelphia County Post-Graduate Institute, the Neuropsychiatric Seminar of the Region of New York for Selective Service in New York City, the Pennsylvania Psychiatric Society first semi-annual Institutional Hospital meeting at the Allentown State Hospital and the Philadelphia

Psychiatric meeting at the College of Physicians and Surgeons.

Dr. W. H. Perkins, Professor of Preventive Medicine at Tulane, has been selected as President of the New Orleans Council of Social Agencies.

Dr. J. H. Musser delivered an oration on medicine at the meeting of the Illinois State Medical Society in Chicago, Tuesday, May 20. He also spoke at the meeting of the California State Medical Association on May 6.

At the first annual meeting of the Louisiana Association of Pathologists Dr. Edwin H. Lawson and Dr. Béla Halpert became members of the Council; Dr. William R. Mathews was elected president, Dr. Andrew V. Friedrichs, vice-president; and Dr. Albert E. Casey, secretary.

LOUISIANA MANEUVER AREA COUNCIL

The citizens of Louisiana have tackled the biggest job in the history of the State. They are to furnish a maneuver site of 15,000,000 acres for the United States Army War Games scheduled for next September. More than 500,000 men representing the greatest troop concentration in the annals of the War Department will participate in these maneuvers.

"Louisiana's Battlefield" embraces an area larger than Holland, Switzerland, Belgium or Denmark; 23,475 squares miles of 31 parishes will constitute the gigantic stage for the Army forces.

In setting the stage for this stupendous production, the Louisiana Maneuver Area Council, appointed by Governor Sam Jones, must gain clearance rights on this vast acreage from more than 100,000 landowners. However, within the first week of the Council's program, more than 10,000 Agreements were signed by property owners.

This response to the Army's request for a maneuver area sufficiently large to maneuver the greatest troop concentration in the country's history has been amazing. Maneuver Agreements are coming in to the Rents and Claims Office at Camp Beauregard in a flood of mail sacks that has necessitated the doubling of office personnel to handle the filing and clerical work involved.

This constant stream of signed agreements is an eloquent testimonial to the patriotism of the people in Louisiana and to their willing spirit to do their part for National Defense.

Not a section of the 15,000,000 acres will be overlooked. The organization of the Louisiana Maneuver Area Council reaches into every ward in the 31 parishes of the Maneuver Area. Ward Committees are responsible to their Parish Councils for a complete coverage of clearance rights so that the parish land block can be presented with clear title to the War Department.

Major Val Irion, State Maneuver Area Director, has launched a campaign to contact every state and local business, professional, fraternal and social organization to gain their cooperation with the State Council and in particular with the local Council in their home parish.

The parishes included in the Maneuver Area are: Winn, Grant, Ouachita, Caldwell, LaSalle, Richland, Franklin, Catahoula, Concordia, Caddo, Bossier, DeSoto, Webster, Red River, Lincoln, Jackson, Bienville, Vernon, Beauregard, Calcasieu, Allen, Jefferson Davis, Sabine, Natchitoches, Avoyelles, Evangeline, St. Landry, Acadia, Lafayette, St. Martin, Rapides.

The State Council's Executive Board comprises: Governor Sam Jones as Chairman and Brigadier General Raymond H. Fleming, Vice Chairman; Major Val Irion, State Maneuver Area Director, and Colonel R. B. Cole, Army Liaison Officer. Council members are Lucille May Grace, Director of the State Land Department; Harry D. Wilson, Director of the Department of Agriculture; John E. Coxe, Superintendent of Education; G. T. Owen, Director of the Department of Commerce and Industry; Brigadier General Steve Alford, Director of Public Safety; James D. Mercer, President State Police Jury Association; Theo. O. Hotard, President of the Louisiana Association of School Board Members and James B. Aswell, Director of Public Relations for the Executive Department of the State.

Louisiana is doing its part for the National Defense program.

HEALTH OF NEW ORLEANS

The Bureau of the Census, U. S. Department of Commerce, has to report that for the week ending April there were 135 deaths in the City of New Orleans in contrast to the previous week when only 116 were reported. Of these deaths, 79 occurred in the white population and 56 in the negro; seven were in infants under the age of one year. There was a slight increase in the number of people who died in New Orleans in the following week which terminated April 19. Of the 142 deaths which took place, 85 were in the white and 57 in the negro division of the population. One explanation for the increase in deaths that took place this week lies in the fact that some 11 negro infant deaths were reported and nine white, as compared with the previous week when only two negro and five white infants died. There was a drop of ten in the total number of deaths for the week closing April 26. One hundred and thirty-two fatalities occurred, distributed 86 white and 46 negro. There was a reduction of five in the infant deaths this week. The number of deaths for the week which came to a close May 3 was approximately the same as that for the previous week. There were 81 white people dying in the city in this period and 54 negro, for a total of 135; 15 of which were in infants and 11 of these were negro children.

INFECTIOUS DISEASES IN LOUISIANA

The morbidity report of the Section of Epidemiology of the Louisiana State Department of Health for the sixteenth week of the year terminating April 19 showed a marked decrease in the number of cases of measles, from the 167 reported in the previous week to 70 this week. Additional diseases appearing in numbers greater than ten included 153 cases of syphilis, 68 of hookworm infestation, 64 of pneumonia, 45 of gonorrhea, 32 of pulmonary tuberculosis, 24 of cancer, 16 of chickenpox, 14 of influenza and 10 of whooping cough. A case of typhus fever was reported in Orleans Parish. For the seventeenth week of the year, ending April 26, there was a slight diminution in the incidence of measles which was reported as being 67 cases. The of syphilis showed a sharp jump to 246 cases, also gonorrhea with a jump to 69. Other double figure diseases included 36 cases of pneumonia, 29 of pulmonary tuberculosis, 14 each of cancer and influenza, and 10 each of chickenpox and malaria. Of the rare infectious diseases, a case of typhus fever and one of smallpox were discovered in New Orleans. The next week, which came to an end May 3, showed that the reportable diseases were following pretty much the five year average with nothing particularly outstanding. The report showed 152 cases of syphilis, 57 of gonorrhea, 47 of measles, 23 of pulmonary tuberculosis, 22 of septic sore throat, 21 of malaria, 17 of pneumonia, 14 of dysentery, 12 of hookworm infestation, and 11 of cancer. Two cases of typhus fever were reported, one arising in Rapides and one in Orleans Parish. For the week ending May 10, the following diseases were reported in figures greater than ten: 226 cases of syphilis, 43 of measles, 30 of whooping cough, 31 of pneumonia, 25 of gonorrhea, cancer and pulmonary tuberculosis 22 each, malaria 11 and hookworm 10. An imported case of poliomyelitis was listed by the City Board of Health of New Orleans.

DIRECTORY OF MEDICAL SPECIALISTS 1942 EDITION

Specialists eligible for listing in the forthcoming second edition of the Directory of Medical Specialists are urged to fill in and return promptly the questionnaires for biographic data now being mailed out by the publication office.

This Directory is the official publication of the Advisory Board for Medical Specialties, issued every two years, and listings are limited to those formally certified by any of the fifteen American Boards examining in the medical specialties. There is no charge for such listings.

The Directing Editor is Paul Titus, M. D., 1015 Highland Building, Pittsburgh, Pennsylvania, and the secretaries of the fifteen American Boards constitute the Editorial Board.

CHANGE OF TITLES

Beginning with the issue of April 19, 1941, the title of the current publication "Weekly Health Index" will be changed to "Weekly Mortality Index." At the same time, the title of the current publication "Weekly Accident Bulletin" will be changed to "Motor Vehicle Accident Deaths."

This change of titles does not in any way affect statistical comparability with preceding reports.

BOOK REVIEWS

The Diagnosis and Treatment of Diseases of the Esophagus: By Porter P. Vinson, B. S., M. A., M. D., D. Sc., F. A. C. P. Springfield, Charles C Thomas, 1940. Pp. 224; 98 figs. Price $4.00.

This subject is one which the endoscopist, surgeon, internist, gastroenterologist, and others have frequently neglected. The author in this brief monograph has selected an unusual topic which merits broad and complete treatment.

The style is readable and simple. The illustrations are interesting and well reproduced. The discussion of the diagnosis and treatment of esophageal disease is not as complete as could be desired. The author fails to mention the possibility of being unable to pass a string for dilatation in cases of cardiospasm. Discussion of esophageal varices is not accorded as much space as it warrants. It is by no means clear why an extremely brief, unsympathetic treatment of gastroscopy should be added to the topics covered.

This brief introduction to diseases of the esophagus makes us realize that the need exists for a more complete treatment of this subject.

MORRIS SHUSHAN, M. D.

Human Nature, in the Light of Psychopathology: By Kurt Goldstein. Cambridge, Mass., Harvard University Press, 1940. Pp. 258. Price $2.50.

In this extremely interesting and very serious book, an eminent psychiatrist endeavors to present a systematic interpretation of all of the data, with reference to a conception of the nature of man, in the light of psychopathology; he makes an excellent job of it.

The volume is the outcome of the William James lectures, given at Harvard University in 1938 and 1939. It represents the author's examination of the fundamental problem of human personality and is based upon his experiences as a psychiatrist especially during the first World War.

The author believes that the readjustment required by those who have brain diseases, which

must be set in motion by the therapist, is possible only on the basis of a study of the afflicted individual as a whole. He also thinks that one of the basic errors of the Freudian theory is that the tendencies observed in sick people are considered as the basic drives of the normal human being. He further points out that, even though the individual is primary to society, without question he is influenced to a very high degree by society and that one can realize his nature only within the group, and his life is determined by the habits, customs and institutions characteristic of the society in which he lives.

Doctor Goldstein is inclined to the opinion that the experiences of the last decade in Europe have awakened great doubt regarding the character of human nature. His book is a valuable contribution to psychiatric literature. His views will undoubtedly be of deep interest to many other readers than physicians and psychologists, in fact to all thoughtful persons who are groping toward a valid, efficient and dependable philosophy for these days of intolerance and suspicion, aggression and disintegration.

C. P. MAY, M. D.

Obstetrics in General Practice: By J. P. Greenhill, B. S., M. D., F. A. C. S. Chicago, Yearbook Publishers, Inc., 1940. Pp. 448. Price $3.50.

The author of this short volume of 448 pages has presented the essential features of the practice of obstetrics in an easily readable manner. He has made no attempt to reach the "specialist" with this volume and constantly has referred the reader to more detailed works when more detailed information is desirable. The volume is intended for general practitioners only and, for that reason, is brief, succinct and more or less dogmatic.

The subject matter is well divided into brief chapters, thirty-seven in all. The greater part of the material is devoted to the management of obstetric cases with proper emphasis upon possible complicating factors. Operative methods, although clearly portrayed, are placed in the background. There are numerous illustrations which aid in clarifying the descriptive passages.

A few minor criticisms can be made, chiefly about the brevity with which some subjects are handled, namely, endocrinology, cesarean section, and analgesia. Whereas cesarean section should be employed preferably by a trained obstetrician, many general practitioners nevertheless perform this operation and the preferred type of section should be described. The differentiation between ectopic pregnancy and acute salpingitis, a very important differential diagnosis, is somewhat briefly outlined. The author also states that by rectal examination in the first stage the physician can determine abnormalities—even to prolapse of the cord! While the progress of the presenting part can be easily determined in this manner, differentiation of position and obscure presentations require much more skill and experience in rectal examination than most general practitioners usually possess.

The volume is an excellent quick reference for the salient points in obstetrical management. It fulfills the author's purpose very well.

JOHN C. WEED, M. D.

Fractures and Dislocations for Practitioners: By Edwin Oscar Geckeler, M. D. Baltimore, The Williams & Wilkins Company, 1940. Pp. 314. Price $4.00.

As a book designed for the use of practitioners and students, this volume has some rather good points to furnish an impression and a guide towards emergency care and initiation of treatment. As a practical guide, it lies midway between a manual of fractures and a full text on the subject. It is impossible to cover the compensatory phase, the physical therapy and convalescent care in a book as brief as this. For example, the section on simple fractures of the hand is much too brief considering the degree of disability resulting from fractures in this area when inadequately treated. As a means of introduction to the subject the book is adequate, but one using it as a guide for the treatment of a specific fracture should have the opportunity of a more complete study, particularly if the fracture presents any complicating features.

F. J. COX, M. D.

Modern Medical Therapy in General Practice: Edited by David Preswick Barr, A. B., M. D., LL. D. Baltimore, Williams and Wilkins Company, 1940. Pp. 3661. Price $35.00.

This work is of such scope that it is really an encyclopedia of treatment.

The distinguished editor is so well known that any work bearing his name would naturally command the respect of the medical world. The one hundred and six contributions have been selected with unusual discrimination and many of the leading names in medicine are found "among those present."

The first 750 pages present general therapy, including such subjects as psychotherapy, the use of drugs, vaccines and sera, dietotherapy, physiotherapy, climatotherapy, and occupational therapy. These subjects are well presented and include a wealth of material.

The index covers 99 pages. The remaining nearly 3,000 pages are given to a consideration of diseases. The text is not confined strictly to therapy, but there is always an introductory build up that adds much to the value of the work. For example, in the section on pneumonia, the first ten and a half pages include a discussion of history, incidence, classification, etiology, epidemiology, pathology, symptoms, laboratory data, diagnosis and prognosis. Thirty-four pages are devoted to treatment proper. This is followed by 131 references to papers that have been quoted in the text.

The book is well printed. The type is large and clear and the style of composition favors easy and comfortable reading. The divisions of the text by subtitles facilitates ready reference.

Altogether it is a most excellent contribution to medical literature and a valuable addition to any physician's library.

O. W. BETHEA, M. D.

The Medical History of Contraception: By Norman E. Himes, Ph. D. Baltimore, Williams and Wilkins Co., 1936. Pp. 521. Price $2.50.

This excellent book represents the adaptation of medico-historical technic to a new field. It is an original and thorough piece of research and is recommended to all who are interested in either medical history or in contraception in its medical, sociologic, psychologic or historical aspects, or in population problems in general.

The book is divided into six major sections, each being followed by an excellent summary of the contents of the particular section. Section one deals with Contraceptive Technic before the Dawn of Written History; Section two, Contraceptive Technic in Antiquity (Western World); Section three, Contraceptive Technic in Eastern Cultures; Section four, Technic in the West during the Middle Ages and Early Modern Times; Section five, Democratization of Technic since 1800 in England and the United States; Section six, Democratization and Its Future Effects.

The first five sections constitute a thorough, interesting and excellent historical survey and no one can quarrel with it. Many may quarrel with certain of the generalizations, philosophic comments, and interpretations found in the last section wherein the author is ruled occasionally by heart rather than head.

There is an excellent bibliography appended.

The author is to be commended on a splendid piece of work, and the National Committee on Maternal Health is to be complimented on supporting this work, making possible its publication, and making it available at such a reasonable price.

B. BERNARD WEINSTEIN, M. D.

Growing Out of Babyhood: By Williams S. Sadler, M. D., F. A. P. A., and Lena K. Sadler, M. D., F. A. C. S. New York, Funk & Wagnalls Co., 1940. Pp. 350. Price $2.50.

This volume is another answer to the mother's every-day problems. It is easily understandable and goes into detail in the handling of all the ordinary problems of childhood. If this were the only book edited recently on child guidance to parents and teachers, the reviewer would feel it fitted into many homes. There have been, however, a number of books of this nature within the past two years, which serve the same purpose. The authority of the two authors will recommend this volume.

SUZANNE SCHAEFER, M. D.

The Neuroses in War: By Several Authors under the Editorship of Manuel Miller, M. A. (Cantab.), M. R. C. P., D. P. M. (Cambs.) New York, The Macmillan Co., 1940. Pp. 250. Price $2.50.

This admirable and overwhelmingly authoritative book is a clear and concise critical evaluation of the present status of the neuroses in war and it is a valuable aid to the understanding and treatment of such conditions. It is indisputable evidence that medical science has advanced with such rapidity that many of us are sometimes dazzled by the medicine of today and that psychiatry has reached a high level of development.

During the first World War the contributors had ample opportunity to study neurotic casualties of warfare on a very large scale. In the interval of peace they have had time to coordinate the material collected and to formulate and publish their deductions in this volume.

Human nature has not changed. The conclusions are as valid as ever and the need for them is infinitely greater. The terrors and privations of war are no longer restricted to those in active service. Women and children, factory workers and farmers, city dwellers and those who reside in remote villages are affected, the problems of war hysteria have increased proportionately and with them the need for adequate preparation.

The treatise is the work of eleven collaborators and consists mainly of eleven sections. Of special interest are the chapters on "The Differential Diagnosis of the Psychoneuroses of War"; "Treatment by Suggestion and Hypno-Analysis"; "Technic of Other Psychotherapeutic Methods" and "The War of Nerves: Civilian Reaction, Morale and Prophylaxis." In them are exhibited proverbial resourcefulness and ingenuity.

Intense interest in war, increased as it is with the wide publicity given to all details, is ever adding to the confusion in the public mind and it is very likely that the influence of this remarkably fine contribution may have a direct bearing on the practice of medicine in your community.

C. P. MAY, M. D.

Poems of a Doctor: By Edward Lovelle Stewart, M. D. Kansas City, Mo., Brown-White Co., 1940. Pp. 157; por.

Whenever one finds a novel or a book of verse by a physician one cannot but recall Moynihan's delightful address on "Medical Truants"—physicians who deserted medicine to the enrichment of other arts. The names of Ibsen, Schiller, Goldsmith and Keats come to mind. Then one recalls the busy men who remained true to medicine the while writing verse, and occasionally verse of such quality that it may be called poetry. The names of Weir Mitchell, Holmes, Armstrong, Ross, Jenner, Hans Much, Tinoser, and McCrae are recalled.

This book of verse by Doctor Stewart is divided into four collections: College Poems, Miscellan-

eous Poems, Family Poems, and Forty Years Ago. The last named divisions is an interesting series of verse—letters written to an old friend over a period of years.

While this volume will make a poor shelf-mate for Holmes or Mitchell it contains many interesting verses and is recommended to those interested in the lyric productivity of physicians.

B. BERNARD WEINSTEIN, M. D.

Clinical Urology: By Oswald Swinney Lowsley and Thomas J. Kirwin. Baltimore, Williams and Wilkins Co., 1940. 2 v. illus. Price $10.00.

Clinical Urology is composed of two volumes. The first consists of chapters on history-taking and physical examination, examination of the urine, tests of renal function, instrumental examination, roentgenography of the genito-urinary tract, anesthesia in urology, gonorrhea in the male, radium and roentgen ray therapy of the genito-urinary tract, and chapters on the penis, scrotum, and scrotal contents, vas deferens, seminal vesicle and ejaculatory duct, female genitalia, male urethra, Cowper's glands, female urethra and prostate gland. The second volume covers the bladder, ureter, and kidney.

The chapters are so arranged that each urogenital organ is taken up in its anatomic sequence from without inward, and a discussion of the embryology, anatomy, anomaly, physiology, injury, disease, operative and non-operative approach to each is given.

This arrangement enables the authors to cover each subject completely, and gives the reader an opportunity to make a comprehensive study of urology. The subject matter is so phrased that it lends to easy reading without being superfluous, and enables one not versed in urology to follow the theme with ease.

The detailed information contained in original articles, or in volumes limited to certain diseases in urology, is not found in this work; but this is to be expected, for such comprehensive information would be impractical when the entire subject of urology is discussed.

It is true that references are made to outstanding contributions in the literature, and the opinions of various authorities are quoted, but in most instances the opinions rendered are those of the authors. The list of references at the end of each subject can be considered selective, if not extensive.

The operative technics are voluminous and beautifully illustrated. They represent the procedures practiced, and in some instances those originated by the authors. The roentgenologic illustrations are exceptionally clear and representative.

From the standpoint of the student, the volumes lack extensive statistical data. In addition, there are no plates on embryology, and no anatomic charts or illustrations, excepting those representing disease processes and surgical procedures. Advanced students interested in pathology will be disappointed in the scarcity of microphotographs.

The plan used in writing the volumes is excellent. In spite of the vast material encompassed, it is comprehensive, and surprisingly condensed. *Clinical Urology* is recommended to anyone interested in this subject.

JOHN G. MENVILLE, M. D.

A Guide to Human Parasitology: By D. B. Blacklock, M. D. (Edin.), D. P. H. (London), D. T. M. (Liver.), and T. Southwell, D. Sc., Ph. D. Baltimore, Williams and Wilkins Co., 1940. Pp. 259. Price $4.00.

Publication of the fourth edition of this guide provides evidence of its usefulness to the medical practitioner and student. The volume contains introductory chapters on the scope of the field, the essential equipment and useful technics for the examination of blood and feces for parasitic objects. *Ad seriatim* there are then briefly considered the spirochetes (Group Spirochaetacea), the parasitic amebae (Rhizopoda), the hemoflagellates and intestinal flagellates (Mastigophora), the malaria parasites and their relatives (Sporozoa), *Balantidium coli* (Ciliata), the tapeworms (Cestoda), flukes (Trematoda), and roundworms (Nematoda). There are numerous supplementary diagrams, synoptic tables and useful information on postmortem examination, geographic distribution of parasites, sources of human infection, organs of the human body harboring the parasites, diagnostic keys, useful chemical reagents and apparatus, and a short list of "larger textbooks."

Each parasitic organism presented is considered under the headings of "geographic distribution", "habitat" in the body, "morphologic characters", "life history", "pathogenicity" and "diagnosis." The guide is preclinical in its perspective, since it does not present information on symptomatology, treatment, prognosis or prevention.

On the whole the information is sound and the terminology modern. However, the newer American technics for the recovery and diagnosis of parasitic objects in feces are not mentioned, the names employed for spirochetes (p. 32) are archaic, and several outmoded names of helminths have been noted, including "*Dibothriocephalus latus*" for the broad fish tapeworm (pp. 95, 111, 199) and *Taenia granulosa* p. (120, 200) for the hydatid worm.

The volume is clearly printed, well illustrated with line drawings and two color plates, has a good subject index and has extremely few typographic errors.

ERNEST CARROLL FAUST, PH. D.

Handbook of Bacteriology: By Joseph Warwick Bigger. Baltimore, Williams and Wilkins Company, 1939. Pp. 466. Price $4.25.

This short handbook should be useful to students of bacteriology, for it covers the essentials of the subject. Larger texts should be consulted

for detailed material. Some of the colored plates in the book appear to be exaggerated but this may serve to emphasize their meanings.

WILLIAM W. TRIBBY, M. D.

Diseases of the Digestive System: Edited by Sidney A. Portis, B. S., M. D., F. A. C. P. Philadelphia, Lea and Febiger, 1941. Pp. 952. Price $10.00.

Fifty prominent authorities have collaborated in the presentation of this study covering gastroenterology in a single volume. There are 43 chapters, many of which approach monographic proportions and which, in many instances, are actually condensations of a text the particular contributor has written. Scholarly in every respect, thorough in detail with voluminous bibliographies appended to each chapter, it stands as a source of information unrivaled in its field.

Introductory chapters consist of an interesting historical survey and an excellent review of anatomy and physiology which are the foundation for the clinical aspects which are scientifically handled with regard to etiology, pathology and diagnosis. Gastrointestinal manifestations due to psychiatric, neurologic and cardiovascular-renal disease, as well as those related to metabolism and allergy, are given as adequate attention as are the more specific entities of gastroenterology. Therapeutic considerations are excellent and include the medical and surgical advances which only reached the current literature in recent months.

Not wishing to omit praise for each of the authors, the reviewer nevertheless feels forced to bring attention to the elaborate review of physiology by Necheles, Ivy and McSwiney, the masterful interpretation of gastrointestinal pain by Chester Jones, and the condensed parasitology by Faust and Craig. There is some disappointment in that a peritoneoscopist was not asked to add to the excellent endoscopic information offered by Porter Vinson and Rudolph Schindler. Throughout the volume the careful editing of Sidney Portis is evidenced in his footnotes but it is undoubtedly true that little criticism or addition could be added to the excellent work of each contributor.

This is the outstanding study without any true inadequacy which is a thoroughly satisfying text for student and teacher, a sufficiently scientific treatise to please the most exacting specialist and yet it is so practical that it is a valuable aid to the practitioner.

GORDON MCHARDY, M. D.

Test Tubes and Dragon Scales: By George C. Basil, M. D., in collaboration with Elizabeth Foreman Lewis. Philadelphia, The John C. Winston Co., 1940. Pp. 316. Price $2.50.

This is not a textbook or scientific treatise on medicine but a delightfully written account of the conflict between modern medicine and the philosophy and superstitution of inland China a decade ago, as viewed through the eyes of a young American physician who spent a few eventful years as superintendent of the "Syracuse-in-China" Hospital at Chungking. The optimism of the West came up against an almost impregnable wall of custom, habit and inertia. To present the Chinese point of view a few of the chapter titles are taken from ancient proverbs, as "even the gods find it difficult to distinguish between pills, powder and plasters", "to become a famous doctor, a man needs to know little" and "only the wealthy can afford the law courts." Even though the Western physician's zeal again and again met with stolid resistance, he gradually gained the respect and friendship of the wealthy and poor alike among whom he lived and to whom he ministered. His return to America was dictated by the inability of his wife to become acclimatized to the enervating environment of humid mid-China (a "witch's caldron of heat and murk and filth"), and not by his own desire to leave a people to whom he became devoted.

The volume is generously illustrated with marginal sketches made in China by Raymond Creekmore. These provide faithful character and color to the pages.

ERNEST CARROLL FAUST, PH. D.

PUBLICATIONS RECEIVED

Paul B. Hoeber, Inc., New York City: Brucellosis (Undulant Fever), Clinical and Subclinical, by Harold J. Harris, M. D. A Manual of Allergy, by Milton B. Cohen, M. D.

Lea & Febiger, Philadelphia: Arthritis and Allied Conditions, by Bernard I. Comroe, A. B., M. D., F. A. C. P.

J. B. Lippincott Company, Philadelphia: Essentials of Dermatology, by Norman Tobias, M. D.

The C. V. Mosby Company, St. Louis: The Mask of Sanity, by Hervey Cleckley, B. S., B. A. (Oxon.), M. D.

W. B. Saunders Company, Philadelphia: Physical Medicine, by Frank H. Krusen, M. D., F. A. C. P. Textbook of Pediatrics, by J. P. Crozer Griffith, M. D., Ph. D., and A. Graeme Mitchell, M. D.

Charles C Thomas, Springfield: The Pharmacology of Anesthetic Drugs, by John Adriani, M. D.

The Torch Press, Cedar Rapids, Iowa: The Doctor Takes a Holiday, by Mary McKibbin-Harper, M. D.